PS Form 10-900-b
tevised March 1992)

64501073

RECEIVED 2280
APR 29 2010
NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

APR 09 2010

OMB No. 1024-0018

Inited States Department of the Interior
lational Park Service

lational Register of Historic Places
lultiple Property Documentation Form

his form is used for documenting multiple property groups relating to one or several historic contexts. See instructions in *How to Complete the Multiple roperty Documentation Form* (National Register Bulletin 16B). Complete each item by entering the requested information. For additional space, use ontinuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items.

X New Submission ____ Amended Submission

. Name of Multiple Property Listing

rchaeological Resources of the Central Plains Tradition in the Loess Hills Region of Iowa

. Associated Historic Contexts

Name each associated historic context, identifying theme, geographical area, and chronological period for each.)

lebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400

. Form Prepared by

ame/title Cynthia L. Peterson, Melody K. Pope, Michael J. Perry, John G. Hedden, James L. Theler / archaeologists, and Mary J. Adair / paleoethnobotanist (cindy-peterson@uiowa.edu)

rganization Office of the State Archaeologist, The University of Iowa date March 16, 2010
Theler: University of Wisconsin Adair: University of Kansas

treet & number 700 Clinton Street Building telephone 319-384-0732

ity or town Iowa City state Iowa zip code 52242
Theler: 1725 State Street, La Crosse, WI 54601 608-785-6780
Adair: Spooner Hall, 1340 Jayhawk Blvd., Lawrence, KS 66045 785-864-2675

. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. (___ See continuation sheet for additional comments.)

Barbara A. Mitchell DSHPO — April 16 2010
Signature and title of certifying official — Date

STATE HISTORICAL SOCIETY OF IOWA
State or Federal agency and bureau

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Erika K. Martin Seibert — 6/11/10
Signature of the Keeper — Date of Action

rchaeological Resources of the Central Plains Tradition in the Loess Hills Region of Iowa — Iowa
ame of Multiple Property Listing — State

able of Contents for Written Narrative

rovide the following information on continuation sheets. Cite the letter and the title before each section of the narrative. Assign page numbers according) the instructions for continuation sheets in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Fill in page umbers for each section in the space below.

Primary location of additional data:
_X_ State Historic Preservation Office
___ Other State agency
___ Federal agency
___ Local government
_X_ University
___ Other
Name of repository:
Office of the State Archaeologist at The University of Iowa

E. Statement of Historic Context

Introduction

What the cliff dwellings of the ancestral Pueblo peoples are to southwestern archaeology, the earthlodge dwellings of the ancestral Plains Villagers are to Midwest and Plains archaeology—habitations constructed during the formative period of time when farming-based, sedentary societies emerged across North America. In the Loess Hills the focal centers of settlement are earthlodges of the Central Plains tradition at the confluence of the Platte and Missouri rivers (especially in Mills County, Iowa) in the south and villages of the Middle Missouri tradition along the Big Sioux River (Plymouth and Woodbury counties) in the north. Both areas are home to a number of very important Late Prehistoric sites, including an array of earthlodge dwelling sites in the south, nucleated and palisaded villages in the north, and an array of different kinds of mortuary sites and other small, perhaps special function sites recognized as artifact scatters in the state site files. As a result of the conspicuous Late Prehistoric presence in the Loess Hills region—particularly as evidenced by the *astonishing numbers of earthlodge dwellings* in the Glenwood locality—the Loess Hills became a prime target of 19th century antiquarians followed by 20th century local avocational and eventually professional archaeologists who have recorded hundreds of earthlodges in the Glenwood area.

Perhaps nowhere in the Midwest and Plains regions are there more dense concentrations of Late Prehistoric dwelling sites than in the Loess Hills at the confluence of the Platte and Missouri rivers near the modern city of Glenwood (Figures E1 and E2). Located on the hilltops and valleys of Pony and Keg creeks, nearly all within a 10-mile radius of the Platte and Missouri confluence, are hundreds of documented examples of Central Plains tradition Nebraska phase sites. The Central Plains tradition comprises a number of broadly similar archaeological manifestations of earthlodge-dwelling hunters and farmers living in Kansas, Nebraska, and Iowa during roughly the 10th through 14th centuries A.D. These sites are typically comprised of semi-subterranean residential earthlodge structures with extended entryways. While most currently inventoried sites evidence only one or two earthlodges (hereafter, also referred to as "lodges"), there are a few known cases, notably the Kullbom site environs (13ML10–13, 13ML51, and 13ML376–377), where as many as 17 lodge structures occur relatively close to one another, within a 130-x-250-m area. The archaeological manifestation of the Central Plains tradition in the State of Iowa is referred to as the Nebraska phase. Nebraska phase peoples lived in eastern Nebraska and southwestern Iowa along the Missouri River and the lower reaches of its tributaries.

The purpose of this Multiple Property Documentation Form (also referred to herein as the MPDF), *Archaeological Resources of the Central Plains Tradition in Iowa*, is to provide the context for nominating significant Central Plains tradition sites in Iowa for inclusion on the National Register of Historic Places (NRHP). A single context, *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400,* has been developed in this MPDF. The beginning and end dates refer to radiometric determinations and artifact cross dating that bracket the earliest and latest known Central Plains tradition occupations in the State of Iowa. This context represents a discrete geographical concentration of sites within the southern to middle Loess Hills of Iowa. Other contexts may be developed at a future date.

The Nebraska phase represents one of the most intensively studied prehistoric cultures, both in the State of Iowa and among the various Central Plains manifestations in Kansas and Nebraska. In Iowa, Charles R. Keyes (1951) referred to the earthlodge sites as the Glenwood culture, after the county seat of Mills County, near where most of the Nebraska phase sites in Iowa have been found (Figure E1). The Glenwood culture is still a commonly used name for Nebraska phase sites in Iowa, although archaeologists prefer to consider Glenwood one of a number of localities containing Nebraska phase sites (Blakeslee and Caldwell 1979). Outside of Iowa, Nebraska phase occupations both predating and postdating the occupation of the Glenwood locality have also been recognized (Steinacher and Carlson 1998). Tiffany (2009) prefers the classifications Nebraska variant and Glenwood phase (Krause 1969). Because the Nebraska "phase" classification is presently the most widely accepted usage, that term will be used in this MPD.

A number of sources were used in developing the historic context. These include but are not limited to: Adair 1988, 1994; Ahler and Kay 2007; Alex 2000; Anderson 1983; Anderson and Anderson 1960; Anderson and Whitworth 1977; Bardwell 1981; Billeck 1991, 1992a, 1993; Billeck and Rowe 1992; Blakeslee 1978, 1984, 1987, 1989, 1990; Blakeslee and Caldwell 1979; Bozell and Ludwickson 1994, 1999; Brown 1967; Chidley 1998; Crimson and Green 1992; Green 1990, 1992; Green ed. 1990, 1991; Green and Asch 1995; Hirst 1988c; Hotopp 1978a, 1978b; Hotopp and Bensend 1973; Ives 1955; C. Johnson 1998; Johnson 1972; Kaldahl 1993; Ludwickson 1979; Masters 1987; McNerney 1987; Morrow 1995; Orr 1942a, 1942b; Pepperl 2006; Perry 1998a, 2001, 2008; Peterson 1968; Roper 1995, 2007; Roper and Pauls 2005; Steinacher and Carlson 1998; Thiessen 2001; Thompson and Bettis 1980; Tiffany 1986, 2002; Tiffany and Abbott 1982; Wedel 1986; Wood 1969, 1998; and Zimmerman 1971, 1977a, 1977b. Whittaker and Newman (2010) have conducted the most recent archaeological and archival work at Nebraska phase sites in Iowa in support of the present multiple property documentation.

Central Plains Tradition and the Nebraska Phase

The Great Plains region of North America has been an area of major interest in American archaeology since the early part of the twentieth century. Using the spatial divisions as defined by Willey and Phillips (1958), this area has been divided into five subareas identified as the Central Plains, the Southern Plains, the Northwestern Plains, the Middle Missouri and the Northeastern Periphery (Wedel 1961). The Central Plains includes areas primarily within the states of Kansas, Nebraska and eastern Colorado (Figure E3). In the early twentieth century formal archaeology in this area was in its infancy. Early amateur archaeologists in Kansas, Nebraska and western Iowa revealed evidence of prehistoric sites comprised of the remains of semi-subterranean lodges. Pits within these lodges suggested early agriculture practices being employed by the site's occupants. With the establishment of the University of Nebraska Archaeological Survey in 1929, professional archaeological studies began in the area. Major work of the early years was carried out in the investigation of the prehistoric earthlodge sites in Nebraska (Strong 1935). The focus of this early work was to develop a model to associate the origins of historically recognized groups in the area, primarily the Pawnee, with the identified prehistoric earthlodge sites. Continued investigation and comparison of the

prehistoric earthlodges in Nebraska during the early- and mid-twentieth century provided the foundations for the eventual definition of a Central Plains tradition. The development of the Central Plains tradition followed the period of initial recognition of the Nebraska and Upper Republican "Cultures" within the State of Nebraska.

Central Plains tradition sites have been recognized for over 120 years (Gilder 1909; Proudfit 1881a, 1881b). The development of the taxonomic system used to label these sites has been an ongoing effort by archaeologists to better define the cultural relationships that may have existed among the populations of people who occupied these sites. Early excavations at sites in eastern Nebraska led to the definition of the "Nebraska Culture" (Gilder 1909, 1926). Excavations at this time identified the remains of rectangular earthlodges with four central support posts and extended entryways. Artifacts recovered included globular pots with flaring rims, occasionally decorated with incised lines or finger pinching, notched and unnotched triangular arrow points, small end and side scrapers, diamond-shaped knives and worked bone. The worked bone included bison scapulas which were apparently utilized as hoes in early agricultural practices. Storage pits within these lodge remains also showed evidence of a subsistence based on hunting and gathering as well as a reliance on maize. The lack of European trade goods indicated these sites represented prehistoric occupations. Their locations on terraces that contained buried Woodland period sites led early researchers to determine they must be younger than the Woodland period and likely represented Late Prehistoric sites. Later radiocarbon dating techniques and ceramic cross dating confirmed these early postulations placing the site occupations generally between 950 and 1400 AD (Figure E4; Eighmy and LaBelle 1996; Lensink 2009; Tiffany 2009).

Excavations in south central Nebraska in the 1920s and 1930s led to the identification of populations living a similar lifestyle as the "Nebraska Culture." Differences in geographic location and ceramic variation (primarily collared rims) prompted the definition of these sites as a culture separate from, but obviously closely related to, the "Nebraska Culture." Earthlodge sites in south central Nebraska were defined as the "Upper Republican Culture." In 1935, Wedel proposed a change of the Upper Republican and Nebraska "Cultures" to aspects, using the newly proposed Midwestern Taxonomic Method (McKern 1939) and placed each aspect into a separate phase (Wedel 1935). A number of foci for the Upper Republican and Nebraska aspects were then proposed by Strong (1935) including Lost Creek, Sweetwater, Medicine Creek and North Platte. Wedel (1940) later revised his original classification of the Upper Republican and Nebraska aspects into a single Central Plains phase. This shift was based on the fact that much of the area of central Nebraska between the two defined aspect localities was occupied by culturally intermediate sites (Wedel 1959). Wedel also proposed a third aspect of the Central Plains phase, Smoky Hill, located in north-central Kansas. The Smoky Hill aspect was suggested as possibly representing a simplified version of the Central Plains transition out of the Nebraska and Upper Republican aspects specialized to the east and west (Wedel 1959:628). This interpretation was based partly on the geographical positioning of the sites and partly on the types of ceramics recovered at Smoky Hill sites, which exhibited similar traits to ceramics recovered from both of the previously identified aspects.

A shift in taxonomic systems away from the Midwestern Taxonomic System designations in the 1960s to the Willey and Phillips method (Willey and Phillips 1958) led to the three aspects of the Central Plains phase being redefined into separate phases of a Central Plains tradition (Brown 1966). This reassessment, coupled with subsequent developments in radiocarbon dating, led to numerous interpretations of purported relationships between these groups by archaeologists in the late twentieth century. Additional modifications to the taxonomic system have included the classification of the Upper Republican, Nebraska, and Smoky Hill phases as regional variants of the Central Plains tradition and the subdivision of these regional variants into separate local phases (Krause 1969). These modifications adopt some of the taxonomic usages suggested by Lehmer (1971) including the term "variant" as a distinct cultural entity which has a greater order of magnitude than a phase and which is distinguished from other variants by its geographical distribution, age, and cultural content. Based on this revised system, archaeologists attempted to subdivide the former Upper Republican phase into three phases, the Solomon River, the Classic Republican, and the Loup River (Itskari) phases of the Upper Republican regional variant (Krause 1969:96). Over the past 50 years, disagreement among various archaeologists working in the plains has led to the acceptance of some taxonomic classifications and the abandonment of others. As a result of these disagreements, the literature is riddled with a patchwork of phase, aspect and foci definitions that have been applied to sites of the Central Plains tradition. These taxonomic difficulties are generally related to difficulties in defining material culture traits that qualify as cultural determinants and to problems with the calibration of radiocarbon samples that attempt to provide absolute dates for a relatively short time span of the Central Plains tradition.

Despite the difficulties archaeologists have had in attempts to define exact cultural relationships among sites assigned to the Central Plains tradition, it is still generally agreed that the three phases of the Central Plains tradition have some taxonomic utility. The Nebraska phase is geographically located along the Missouri River and lower reaches of the Platte River in Nebraska and also within the Glenwood locality of western Iowa. The Smoky Hill phase is located in north central Kansas as well as south central Nebraska and the Upper Republican phase is located primarily in central and western Nebraska and Kansas and in eastern Colorado. Variations and similarities in material culture that are identified in each phase may represent interactions between these populations that have not been fully identified.

Historic Context: Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400

Reading the archaeological literature on the Loess Hills region of Iowa, one cannot fail to be impressed by the numbers of earthlodge sites and the rich material cultural repertoire left behind by the pre-Columbian societies who occupied this area, if only for a few centuries. While the time span of occupation is relatively short by many archaeological time scales, it spans that period of human history in the North American mid-continent when people were making the switch from hunting and gathering to a more sedentary agricultural lifestyle. Within this time span, many major interior river valleys and their watersheds experienced demographic spikes as new forms of food production and storage supported larger numbers of people and also tethered them to particular locations for longer periods of time.

Concomitant with producing one's own food come other as yet poorly understood changes, including surplus production of foodstuffs, changes in productive and social relations, increases in violence, negative trends in health, and, in some places, movements of people away from alluvial valleys to easier-to-defend sites in palisades and bluffs like what we see in the Glenwood locality, or to large fortified villages like those of the Mill Creek culture in northwest Iowa. In both cases, larger numbers of people were moving into narrow upland drainage divides in the south or within the walls of palisaded villages in the north, causing population densities in the region to go up. There is also at this time conclusive evidence of interaction or influence among groups within and between regions, particularly with societies referred to archaeologically as Mississippian to the south and east. The identification and interpretation of these changes are diverse, varying according to the predilections of different researchers.

Do settlement trends in the Glenwood locality reflect changing needs for such basic resources as timber, stone or arable land as some have argued (Anderson and Zimmerman 1976; Tiffany and Abbott 1982; Hotopp 1982; Billeck 1993), proximity to the Platte-Missouri confluence (Billeck 1993:16; Hedden 1997; Whittaker and Newman 2010), a desire to move to more protected locales during times of social unrest, attempts to co-opt trade, or some combination of these factors? Does the appearance of multiple-notched arrow points at Glenwood sites similar to arrow points at the World Heritage Site of Cahokia, the large Mississippian town in the American Bottom region near modern-day St. Louis, reflect broad stylistic trends in weapon manufacture, perhaps a response to increased warfare (Hall 1991:20; Billeck 1993:212–222), a buy-in to pan-Mississippian warfare symbolism and technology (Knight 1986:677), or the use of cultural objects with shared meanings and uses, whether for hunting or raids on neighboring villages? Certainly, bundles of similar arrow types in mortuary deposits within Mound 72 at Cahokia suggest social and ideological meanings or values were ascribed to arrows in particular contexts. Does the presence of other 'Mississippian' items including particular types of ceramic containers and decorative motifs at Glenwood sites reflect interaction with Mississippian-affliated groups based on complex, hierarchical exchange relations (Alex 2000; Tiffany 1991b:334–336, 2003:29–30) or contact with and some degree of buy-in to particular Mississippian cult institutions, alliances, or traditions as a result of as yet unidentified historic and social processes (Knight 1986; Henning 2005; Pauketat 2001, 2005; Pauketat and Alt 2003)?

While much of the literature on Mississippian expansion focuses on demographic and economic dimensions, as Knight (1986:681) points out "...that expansion occurred within a framework of changing social forms, the nature of which cannot be ignored." In the southeast, evidence for chiefly co-opting of warfare/cosmogony symbolism occurs briefly between A.D. 1200 and 1350, a span of time that immediately post-dates and to some extent overlaps with the period of expansion of Mississippian traits into neighboring regions, increasing social unrest and conflict, and abandonment of settlements and whole regions. Was the Loess Hills abandonment by Nebraska phase peoples by A.D. 1400 a result of resource depletion, as some have argued (Lensink 1993), social unrest (Ludwickson and Bozell 1994:148; Henning 2005; Alex 2000:182), or other historical and social factors operating at regional and inter-regional scales not yet identified?

The arguments used to support these and other contentions about Nebraska phase peoples in the Glenwood locality span over a century of fieldwork and the use of increasingly sophisticated technologies for identifying and interpreting sites and data categories. Most of this work has been aimed at regional level understandings, with an emphasis on developing culture histories and settlement patterns (Zimmerman and Artz 2006). More recently there has been a shift in emphasis among some researchers to focus on communities and households (Adair 1992; Artz et al. 2000; Billeck 1993; Perry 2001, 2003, 2006; Schermer 1985, 1987a; Schermer et al. 1992). While there are more questions than answers at this time, it is clear that the rich data at Nebraska phase sites in the Loess Hills region of Iowa have great potential to contribute to a dynamic understanding of historical transformations and processes relating to both pre-Columbian and contact period Native American societies in North America.

The sections that follow provide an overview of the *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400* context's associated property types. Then, a brief overview of research topics that underscore the significance of Nebraska phase archaeology and data categories is presented. Finally, timely research questions and directions are discussed.

Associated Property Types

Three associated property types are defined for the *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400* context. These are earthlodge sites ($n = 226$ sites), mortuary facilities ($n = 18$), and artifact scatter sites ($n = 44$). Several of the earthlodge sites also are classified as mortuary facilities. The types of properties associated with this context are discussed in detail in Section F of this MPD; here, the associated property types are simply introduced. Earthlodge sites are by far the most common and occur most frequently in the Iowa Site File (ISF), the official archive of site information from across the state, established in 1959 at the Office of the State Archaeologist (OSA), based at the University of Iowa. Mortuary activities of Nebraska phase people in the Glenwood locality are not well understood, as very few of these sites have been identified and studied. The same situation occurs with artifact scatter sites.

Sites assigned this context are dispersed over a roughly 88 x 5 km area of Iowa's Loess Hills. The concentration of sites is so great in one portion of this geographic area that the 14 x 5 km area around the City of Glenwood is known as the Glenwood locality (see Figure E1). The concentration of sites, particularly around Keg and Pony creeks, is not just the result of intense archaeological scrutiny: Nebraska phase peoples presumably chose this location to settle.

The Iowa Site File contains records of 275 sites that can be linked to the Nebraska phase. Using ethnographic and archaeological data, Billeck (1993:10) estimated that the Glenwood locality in Mills County may contain the remains of between 500 and 1000 earthlodge sites. Prominent archaeologist Charles R. Keyes (1951) reported that Glenwood culture artifacts could be found along the bluffs bordering the Missouri valley from Monona to Fremont Counties. A recent survey by Marcucci (1990) resulted in the location of possible Nebraska phase sites in Pottawattamie County just north of Council Bluffs, but to date, the

northern extent of Keyes's distribution has not been confirmed. With modern archaeological survey methods, Nebraska phase sites are now being identified in settings previously overlooked like low-lying terraces where earthlodges are found buried below a protective layer of flood-deposited silts (e.g., Perry 1990, 2003, 2005). The total number of recorded Nebraska phase sites should only continue to rise, with improved archaeological methods and systematic survey coverage.

To date, mortuary facility sites have been principally identified from within earthlodges. Given the few identified Central Plains tradition burials in Iowa, very little is known about Nebraska phase mortuary practices. Artifact scatters are sites where cultural materials demonstrate a Nebraska phase occupation, but there is no evidence of an earthlodge structure or mortuary use. Like mortuary facilities, few of these sites have been identified and even fewer have been archaeologically excavated. At present, very little is known about artifact scatter sites.

By far the bulk of currently documented Nebraska phase sites are earthlodge sites located in Mills County. An earthlodge site consists of one or more Nebraska phase dwellings and associated internal and external features. In some cases, such as 13ML175, presumed external Nebraska phase features are documented without any evidence of an earthlodge depression. Since the vast majority of known Glenwood sites are earthlodge settings, the remainder of this section discusses their characteristics and locational patterns.

Earthlodge Sites

Nebraska phase sites in Iowa are usually associated with remains of houses termed earthlodges (Figures E5 and E6). Nebraska phase earthlodges were constructed using the typical Central Plains tradition pattern of four central support posts surrounded by shorter, closely spaced, outer wall posts. The floor plan of a Nebraska phase earthlodge was usually square in outline (or less often, rectangular), with rounded corners (Figures E7 and E8). The central support posts were usually substantial oak, walnut, or elm timbers that were charred at the base and set into postholes. Charring the post bases may have helped prevent rot, and may also reflect the method of felling the trees used or sizing the posts (Hotopp 1978a). These vertical members supported large cross beams, and smaller rafters that were interwoven with twigs to form walls and a roof that were plastered with wattle and daub, a mixture of grass and mud. Access to the lodge interior was gained through a similarly constructed extended entryway, often south-facing. Large storage pits were located within and outside of the earthlodges (Figure E9). Lodges were built on both level and sloping topography. Excavation of the upper few inches of soil presumably provided the material for the wattle and daub wall chinking. Where the site of a lodge was sloping, such excavation involved the removal of considerable amounts of soil at the upslope end of the house area to create a more level living surface. Due to such site preparation, earthlodges are sometimes referred to as semi-subterranean structures.

A relatively dispersed pattern of unfortified Nebraska phase farmsteads survive archaeologically as earthlodge remnants. These semi-subterranean, square to rectangular features are sometimes evidenced as surface depressions or scatters of artifacts (Figure E10). Cultivation can obliterate surface depressions, although

intact features, such as post molds, the earthlodge floor, and storage pits may still be preserved below the plowing-impact layer. Deeply buried earthlodges may show no surface evidence. Most earthlodges are found within the Keg and Pony creek valleys, constructed on ridgetops, valley walls, or terraces. Other earthlodge concentrations are present along very small openings into the Missouri River floodplain, including along Boyer, Indian, Kullbom, and Wall hollows.

Archaeologists have developed various formulas to estimate the number of earthlodge inhabitants that are based on ethnohistorical and archaeological data. Most formulas use measurements of lodge floor areas or perimeter lengths coupled with ethnohistoric data, such as bed size (Blakeslee 1989; Naroll 1962; Wedel 1979). Thirty-six excavated Glenwood locality earthlodges yielded floor areas ranging 28.4–171.8 m^2 (306–1,849 ft^2) (Crismon and Green 1992; Hotopp 1978b:113). Blakeslee's (1989) formula suggests the largest Nebraska phase earthlodges in Iowa may have housed about 40 people, which suggests that lodges were occupied by extended families. The nature of Nebraska phase people's use of space outside their earthlodges is poorly understood due in part to lodge-focused research (cf. Gradwohl 1969). Hotopp (1978b:115) tested lodge exterior areas during highway U.S. 34-related excavations, but only one exterior pit feature was encountered. In contrast, abundant remains were recently encountered at lodge-exterior areas of site 13ML175, including three features (Morrow 1995).

Previous Research

Knowledge about the Nebraska phase societies who occupied the Loess Hills of western Fremont, Mills, and Pottawattamie counties has grown steadily over the past century. What was once thought to be an ancient society that remained in the territory for centuries is now recognized to have spanned little more than a century and a half. During their stay, Nebraska phase peoples left behind a rich record of activities that underscores the complexities of their lives, a record that has captured the attention of archaeologists and non-archaeologists alike, generated much scholarly debate, and led to creation of a local museum showcasing the collaborative efforts of local residents and archaeologists, a replicated earthlodge, school programming, and dozens of reports, articles, and books reaching wider audiences in both popular and scientific realms.

Archaeological investigations in the Loess Hills region began in the nineteenth century, piqued by the interests of residents and antiquarians. Work undertaken by avocational archaeologists D. D. Davis and Paul Rowe and early professionals like Dr. Charles R. Keyes and Ellison Orr led to the identification of numerous Nebraska phase earthlodges and attracted the interest of professional archaeologists nationwide. Some of the earthlodges identified by Keyes, Orr, and Rowe were excavated in the 1930s by Works Progress Administration (WPA) crews under the direction of Ellison Orr (Alex 2000; Crismon and Green 1992; Johnson 2003).

The Smithsonian Institution's River Basin Surveys, and later, the National Historic Preservation Act, brought a series of professional surveys to the Glenwood locality beginning in the 1960s. Lionel Brown (1967) surveyed portions of the Pony Creek watershed, identifying and excavating several Nebraska phase earthlodges, mainly in anticipation of the construction of flood-control basins. Archaeological work preceding highway U.S. 34 reconstruction in the 1960s and early 1970s identified a number of Nebraska phase sites and led to the complete excavation of several earthlodges (Anderson 1973; Hotopp 1973a, 1977). In 1991, an effort to relocate sites recorded by Paul Rowe was undertaken by Iowa's OSA (Billeck 1992a, 1992d; Green 1992).

Johnson (2003:6) noted that the aforementioned surveys and excavations provided data for analyses of "prehistoric settlement in the Glenwood locality (Anderson 1961; Billeck 1993; Hotopp 1978a; Tiffany and Abbott 1982; Zimmerman 1971, 1977a). The data have supported pioneering applications of computing in archaeology (Hedden 1993, 1997; Zimmerman 1977b). In addition to these synthetic analyses, there have been several detailed excavation analyses of individual sites (e.g., Anderson and Whitworth 1977; Anderson and Tatum 1978)." Twenty-first century research has focused on developing plans for preservation and research (Johnson 2003; Nagel and Riley 2007), synthesis and re-analysis of previous excavation results or collections (Adair 2009; Alex 2000; Henning 2005; Lensink 2005; Pope 2009; Theler 2009; Tiffany 2002, 2009; Zimmerman and Artz 2006), and geophysical survey (Bales and Kvamme 2005; De Vore 2007). There are reports on Nebraska phase house plans and architecture, ceramic studies, chronometric dating, floral and faunal analyses from several sites, and locational studies. These data, especially those associated with the highway U.S. 34 project, have not yet been evaluated comprehensively but clearly have much potential to refine and address new problems in the archaeology of the Central Plains tradition as expressed at the Glenwood locality.

A Research Emphasis on Regional Settlement Patterns

Sites associated with Nebraska phase societies in the Glenwood locality have much potential to yield important information not just at the level of individual sites but also at regional and interregional levels that address important questions that may be of national archaeological and anthropological importance concerning political and economic organization, relations of power, and general processes of cultural change. Much work in the area has continued to emphasize regional settlement pattern analysis, and continued efforts to refine chronology. In the last few decades, there has been a shift of emphasis on household, community, and "supracommunity" scales of analysis based on the work done in the region principally in the latter half of the last century. Supracommunity generally refers to a pattern of regional integration that transcends the immediate community, usually brought about by new structures or pathways of economic, social or political interaction and relations, including status acquisition, participation in shared ideologies, or social maintenance.

Although lacking in systematic field-based survey, research on the Nebraska phase in Iowa has continued to emphasize the analysis of regional settlement patterns. Field-based work associated with the Nebraska phase in the Loess Hills has focused principally on survey and excavation informed by local landowners and in the context of federally-mandated development projects. Archaeological surveys have tended to emphasize extensive, unsystematic coverage of large areas rather than intensive systematic investigations of smaller tracts. Survey has relied heavily on local resident informants who are knowledgeable about locations of earthlodge sites in the hills who have been willing to share this information with archaeologists, foot surveys that traverse the landscape with the aid of topographic maps in search of earthlodge depressions on suspected landforms, or limited survey prior to development projects. Because earthlodges were dug into the ground they tend to be easily recognized on the landscape as surface depressions, particularly in upland settings (Orr 1942a, 1942b). Both wind and water-borne deposits have accumulated to varying depths in the region and alluvial deposits in the Missouri River plain and at the heads of stream channels may have buried earthlodge sites under several meters of sediment (Hotopp 1978b:115; Perry 1990, 1998a). How many earthlodge sites are buried in this way is unknown. Erosion and development work in the reverse to expose and destroy earthlodge sites over time and an untold number have no doubt been lost to both environmental and human-induced causes.

Archaeological studies of settlement patterns in the Loess Hills have not only had to contend with problems of uneven survey coverage, but also problems of contemporaneity. Earthlodge depressions occur both isolated and in clusters that are often arranged in linear patterns (Blakeslee and Caldwell 1979; Brown 1967; Sterns 1915; Wedel 1956, 1959, 1961; Wood 1969). Whether clustered lodges are villages or the replacement of single lodges during a lengthy occupation of a localized area has been the subject of a great deal of debate in the literature (Anderson and Zimmerman 1976:153; Billeck 1993:8–9; Blakeslee 1990; Gradwohl 1969; Perry 1990, 1998a; Wood 1969, 1998). Antiquarians (Proudfit 1881b) as well as more recent investigators (Anderson 1961:67) have assumed that clusters of lodge depressions are villages without any objective means of verifying contemporaneity among individual lodges. By way of contrast, because of the distances between upland lodge depressions investigated by Orr, most of which were not closer together than about one-quarter mile (400 m), he argued for a dispersed rather than nucleated village settlement pattern. Anderson and Zimmerman (1976) and Zimmerman (1977b), relying on Orr's data, similarly argued for a dispersed settlement pattern with clusters of earthlodges likely representing serial occupations of favored locations. The largest cluster of lodges occurs at and near the Kullbom site (13ML10), located in a small valley that opens into the Missouri River floodplain (Anderson 1961:54). Here, as many as 17 lodges are documented within Kullbom Hollow. Billeck (1993:9) points out that lodges in the Kullbom Valley are spaced further apart than what is typical for Plains villages and therefore villages, *per se*, may not be present in the Glenwood locality. Another settlment cluster appears to exist along the lower reaches of Pony Creek (Hotopp 1978; Perry 2003).

Despite the biases in the site locational data, comprehensive analyses of settlement patterns reveal that earthlodge sites occur in a variety of topographic settings (ridgetops and spurs, side slopes, footslopes, terraces and valley floors) (Anderson and Zimmerman 1976; Billeck 1993:8; Blakeslee 1990; Hotopp 1978a, 1978b; Perry 1990, 1998a; Zimmerman and Artz 2006). Refinements to absolute and relative chronologies for the Nebraska phase in the Glenwood locality have led to the proposition that the earliest settlements occur near the mouth of Pony Creek and along Keg Creek, with later sites found along Kullbom Hollow and the upper reaches of Pony Creek (Billeck 1993:275). Assuming that the earliest occupants migrated to the area from the west and settled at the mouth of Pony Creek, Perry (1998a) interprets the concentration of sites at this locality to result from the replacement of contemporaneously occupied lodges over a 70-year period of time that corresponds to the early years of the Nebraska phase in the Glenwood locality. Perry (1998a; also see Billeck 1993:9) further suggests that the topography of the upland narrow drainage divides would have constrained the placement of closely spaced contemporaneous lodges, resulting in a dispersed and less clustered settlement configuration on the landscape.

While there is no current method to tell us which specific earthlodge sites were occupied at the same time, it is possible to 'correct' regional settlement data by simulating site abandonment and establishment rates in order to estimate the number of sites occupied at any one time, assuming that rates of abandonment and establishment were constant (Dewar 1991). Continued refinements to absolute and relative chronologies, along with a better understanding of earthlodge occupation spans and the cultural geography of Nebraska phase landscapes will increase understandings of regional settlement and demographic trends for Nebraska phase occupations (Artz et al. 2000; Zimmerman and Artz 2006; Billeck 1993:11).

Regionally, the Nebraska phase of the Central Plains tradition spans 120 kilometers paralleling the Missouri River from St. Joseph, Missouri to Sioux City, Iowa, with occupation on the east side of the river mostly confined to the Glenwood locality (Billeck 1993:1–2). As presented in Billeck's (1993) research, the temporal span of the Nebraska phase occupation in Iowa is from A.D. 1150 to A.D. 1290. Tiffany's (2009) cross dating of Nebraska phase materials with well-understood sequences from numerous Oneota sites; the World Heritage Site, Cahokia; and Steed-Kisker settlements (Greatorex 1997) has led to a proposed revision of the Nebraska phase occupation span in Iowa to between A.D. 1250 and A.D. 1400. The ceramic evidence includes the absence or near absence of Initial variant ceramics in Nebraska phase assemblages and vice versa, as well as a complete absence of archetypic Stirling phase Ramey vessels in the Glenwood locality (Tiffany 2007b). Nebraska phase sites do, however, contain low numbers of seed jars and bowls, which post-date the Stirling phase (Tiffany 2009). A reassessment of available radiometric dates for Nebraska phase sites in Iowa has led Lensink (2009) to suggest a 1-sigma range of A.D. 1200 to A.D. 1450 for the Glenwood locality sites, which encompasses Tiffany's proposed 150-year relative date range of A.D. 1250 to A.D. 1400.

Billeck (1993) used a projectile point seriation to support his Glenwood locality occupation span. Glenwood locality assemblages are known to contain notched point forms that disappear from Cahokia after A.D. 1200 (Hall 1967:177; Milner et al. 1984:175). Tiffany (2009:28–29) notes the continued use of these forms at Nebraska phase sites "is typical of the Plains, where side-notched points were made up to contact. Thus, the multi-notched Cahokia point in Glenwood was a continuance of a point style that fell out of favor at Cahokia and does not represent direct contact with Cahokia during the Lohmann (A.D. 1050–1100) and Stirling phases (A.D. 1100–1200), when this point style was popular there (Milner et al. 1984:165, 170)." The terminal extension of the Glenwood locality date revision to A.D. 1400 is based on observations that certain ceramic attributes, including shell temper, design motifs, handle placement, and vessel forms, link late-dating Central Plains tradition sites to the Oneota tradition (Tiffany 2009).

The sequence of occupation within the locality has been hotly debated (e.g., Anderson 1961; Billeck 1993; Brown 1967; Hotopp 1978a; Tiffany 2009; Zimmerman 1977a). Based on a sample of 13 sites, Billeck's (1993) revised temporal framework suggested both regional and local-level trends in settlement patterns. More recent research (Perry 2003; Tiffany 2009) appears to support Anderson's (1961) original proposition: Keg Creek valley was occupied first, followed by the lower reaches of Pony Creek. As the Keg Creek occupation dwindled, the remaining population may have moved farther upstream along Pony Creek. The latest occupation by Nebraska phase peoples is arguably within Kullbom Hollow, facing the Missouri River valley.

In view of the purported short temporal range of the Nebraska phase occupation on the east side of the Missouri River, in order to explore historical processes within the Glenwood locality and wider Central Plains region it will be necessary to develop methods for achieving greater temporal resolution with both absolute and relative chronologies. Earthlodge sites, mortuary facilities, and artifact scatters clearly have much potential to contribute to continued refinements of the Nebraska phase chronological sequence, and by extension, larger geographic expanses of the Central Plains.

Households, Communities and Supracommunities

More recently, researchers have begun to place emphasis on local level understandings with a shift towards households as a unit of study (Allen 1992; Hirth 1993; Wilk and Ashmore 1988). Households have been broadly defined as task-oriented residential units (Netting et al. 1984). Households can be viewed as products of domestic strategies that fulfill the needs of members in terms of production, consumption, distribution, and reproduction (Wilk and Rathje 1982:618). From this perspective, research is directed to investigate the production and consumption of goods within communities based on the evidence of finished products, tools, and facilities used for production, and by-products of production processes. Detailed studies such as these require attention to questions of the size and social composition of producing and consuming groups and access to raw materials, tools and facilities necessary for production as well as to the products, strategies used to cope with demands upon producers and conflicts of interests that different

demands may have created (Pollock et al. 1996; Bernbeck 1995; Pope and Pollock 1995). Although households are the loci at which economic transformations take place and have direct impacts on people's lives, they are also cultural and historical constructs that resist narrow definition so that their boundaries and activities must be determined empirically in each case (Netting et al. 1984:xxiv). Since earthlodges are themselves assumed to be domiciles, they presumably represent a fundamental unit of social reproduction, production and consumption.

In the Glenwood area, earthlodges are only recently being considered from a household perspective (Billeck 1993; Schermer 1985, 1987a; Schermer et al. 1992). Billeck (1993:16–17) proposed a household approach to begin to assemble baseline data on economic functions in order to facilitate comparisons between earthlodge sites. Schermer et al. (1992) also proposed a household approach aimed at testing regional subsistence-settlement models by integrating economic and ecological data recovered from earthlodge site 13ML176, the Wall Ridge site. Clearly, as places where people lived and worked, and as discrete deposits that accumulated over short periods of time, earthlodge sites (their interiors and exteriors) provide opportunities for fine chronological control and for the study of how people interacted and made a living, how communities and groups formed and were structured, and why they disbanded. Although to date the study of households has received only cursory consideration, and principally from a functional-ecological perspective, the potential of household archaeology in the Glenwood locality to address issues of seasonality, settlement patterns, occupation duration, size and composition of households, economic activities, resource stress, intersocietal relations and regional comparisons is recognized.

Since no communities exist in isolation, studies of the interactions among communities form an important part of an anthropological understanding of social, economic and political relations. Visual inspection of Glenwood earthlodge distributions suggests regularity in their spacing, a feature that has heretofore not been examined in depth, but has potential to provide insights into Nebraska phase social and community organization. To date, most research on community patterns at a local level has been directed toward issues of demography and economies employing in some cases elaborate simulation models based on specific assumptions about descent and residential patterns (Artz et al. 2000; Billeck 1993). A cursory assessment of lodge contents reveals numerous items, mundane and esoteric, manufactured from bone, antler, shell and presumably materials not preserved in the archaeological record, including fibers, wood and hide (Billeck 1993). By determining use contexts for productive activities (ceramic manufacture, stone tool manufacture, hide-working, etc.) and then mapping the distributions of tools and production by-products within and between lodges, it will be possible to explore variation in activities, practice, and scale between social units, and by extension it will be possible to explore how labor was organized within and between households. Family structures would have influenced property relations, production and storage practices, and family cycle models combined with detailed analysis of earthlodge architecture and productive activities will allow for a more nuanced understanding of domestic and community interaction. This may be a preferable research avenue until the validity of ethnohistoric and ethnographic parallels can be verified, and when so little is known about the social and economic structures of late pre-Columbian societies on the North American continent.

Interaction among neighboring regions and across large portions of the North American continent is also evidenced in the archaeological record of Nebraska phase societies in the Loess Hills region. Interaction at these larger supracommunity or 'global' scales is important for local and community understandings since it is at these larger scales of interaction that political formations and alliances are forged and broken. The nature of interaction between Glenwood and neighboring regions and groups including Mill Creek, Oneota, and Mississippian polities has been the subject of a great deal of discussion and debate in the literature (Emerson and Lewis 1991; Henning 2005, 2007; Pauketat 2001, 2005; Tiffany 1991a, 1991b, 2007a, 2009). Evidence for movement and interaction is based on the presence of both non-local raw materials and finished items in Glenwood site deposits as well as certain material items and motifs associated with Mississippian cultures. Bison scapula hoes and non-local chert used to manufacture certain types of tools are suggestive of interaction with neighboring groups to the west and north, whereas ear spools, notched arrow points, discoidal stones, ceramic animal effigies, seed jars and water bottles with particular design motifs are associated with Mississippian societies to the south and east. Generally, it has been thought that Mississippian influence in the Glenwood locality was indirect rather than direct, whereas Mill Creek and Mississippian interaction is argued by some to be of a more direct nature (Tiffany 1991a, 1991b). The debate about the nature of Mississippian influence in the Loess Hills region of western Iowa is entrenched in models of Mississippian political and economic structure in the Cahokia-American Bottom region on the one hand, and current views of Plains Village culture on the other. The current chronology for the region places the time of greatest influence during the early portion of the Nebraska phase in the Glenwood sequence, with Oneota influence occurring later in the sequence (Anderson 1961; Billeck 1993:274–275).

Tiffany (2009:29–30) concurs that Mississippian influence was early and Oneota late, but compresses the time frame and newly proposes that the interaction between groups was far more dynamic and direct than previously supposed. Tiffany's model impacts current understanding of the interaction between people in the Glenwood locality and Steed-Kisker and Oneota peoples. According to Tiffany's (2009) view, non-local women in the Glenwood locality, allied through marriage or other means, passed on (diffused) ceramic traditions, such as shell-tempering, red-slipping, and certain designs and vessel forms, to the local Nebraska phase Glenwood population. Toward the end of the Nebraska phase occupation of Glenwood, pottery "morphed 'locally' into Oneota, in a process parallel to that of the Upper Mississippi Valley" (Tiffany 2009:30). Essentially, he posits that the Glenwood locality sites present an opportunity to study the evolution of a new ceramic tradition.

The recent petrographic analysis of pottery, including shell-tempered and red-slipped vessel sherds from five Glenwood locality sites suggests local manufacture for all examined ceramics (Josephs 2009), confirming Anderson's (1961) proposition that at least some shell-tempered ceramics were locally made. Many non-local ceramic traits, such as shell-temper, red slip, and certain vessel forms and decorative techniques at Iowa's Nebraska phase sites now appear to be not trade goods, but a part of the locally made assemblage, possibly fashioned by non-local women allied to Nebraska phase people through various means, including marriage; in essence, Tiffany (2009) argues that it is the influence of women's work in pottery manufacture that transitions the local ceramic tradition into Oneota.

Large numbers of arrow points, hide scrapers, and bison scapula hoes suggest that local residents may have engaged in surplus production of animal skins perhaps for exchange within and between neighboring communities. The presence of bison scapula hoes at Glenwood locality earthlodges, with little to no evidence of their production, suggests that these items may have been acquired through exchange. Alternatively, the possibility of seasonal bison hunts and processing occurring off-site cannot be ruled out at this time. Remains of large mammals, principally deer and elk are commonly found at Iowa's Nebraska phase earthlodge sites. There are distinctive, well-made tools (end scrapers, bi-pointed bifaces, notched arrow points) that occur in large numbers, and which may be examples of specific technologies shaped by their users' contexts and demands, which may have been political, economic or social in nature. A pilot study of endscrapers and bi-pointed knives currently underway suggests intensive use to process hides (Pope 2009). Billeck (1993:202; also see Conrad 1991:131) notes that end scrapers and arrow points are uncommon in household contexts at Cahokia, whereas these items occur frequently and often in large quantities in earthlodge deposits in the Glenwood locality. Billeck (1993:202) suggests that the low number of scrapers and arrow darts in house deposits at Cahokia may indicate that hunting and hide processing were not frequent activities in Cahokia households compared to Glenwood ones. Perhaps time constraints on people in the Cahokia-American Bottoms region precluded their involvement in certain productive activities. Alternatively, surplus hides and hunting may have played a larger role in Nebraska phase people's economy and social relations than in other regions. While a co-occurrence of large numbers of arrow points and hide scrapers at Nebraska phase lodges in Iowa may be interpreted as evidence for hunting and trade in animal skins, it should be emphasized that arrows were also used for warfare and defense in addition to procuring game.

Tiffany (1991a, 1991b) has argued that meat and hide products, particularly bison-derived, were flowing directly from Mill Creek culture groups in northwest Iowa to Mississippian residents at Cahokia and in the American Bottom region more broadly. This view assumes that the emergence of Mill Creek societies is connected to the emergence of centralized Mississippian polities, a process directly connected to increased specialization and centralization of production and the regulation of regional exchange systems (Alex 2000; Kelly 1991; Tiffany 2007b:29–30). Contrasting positions portray the economy as less crucial to political and social change arguing instead that northern Mississippian settlements and influences may be the result of refugees who left what was becoming an increasingly violent and unstable environment in the American Bottom (Emerson and Lewis 1991; Pauketat 2001, 2003). While not discounting the role of exchange completely in acquiring non-local items such as marine shell (see Henning 2007:71), this view considers uses other than strictly economic exchange for the kinds of warfare, cosmological, and ritual-infused Mississippian items found on Mill Creek and Glenwood locality sites, makes fewer assumptions about the mechanics and relations of exchange, and considers Mississippian pan-regional effects as historical processes (Anderson 1987; Hall 1991; Henning 2005:69; Pauketat 2003, 2005). More importantly, these alternative views consider people and their material goods not as passive pawns but active players able to support, accommodate or resist social and political processes that directly affected their everyday lives (Pauketat 2001, 2003).

Nebraska phase sites boast intact households, a rich array of utilitarian and esoteric material goods, a well-preserved zooarchaeological and botanical record, and data on settlement patterns and chronology, offering a regionally unequalled record with which to address important universal themes that engage professionals and the public alike in questions about population displacement and migration, agriculture-economy-environmental relations, and landscapes (cultural, political and natural). Study of Nebraska phase sites touches on themes of population movement and change shortly before Euroamerican contact and the well-preserved dwelling sites offer unparalleled opportunities to explore family formation and concepts of gender, family and the division of labor. Just as our own agricultural economy today is diversified, ranging from small-scale family and community-based farms to large-scale, conglomerate, agri-industries, Native American farmers also were diversified. Iowa's Nebraska phase sites offer opportunities to explore the economic history of early agriculture on the plains and prairies by Native Americans. Loess Hills archaeology also presents an unparalleled opportunity to study and interpret to the public not only the varied ways past farming peoples made a living, but also how choices people made about their settlement locations and livelihoods may have transformed the environment.

While we may never be able to know how certain 'exotic' items made their way to earthlodge sites, the rich archaeological record of this area clearly has much untapped potential for examining activities at household, community and supracommunity scales of analysis. Capable of supporting a more nuanced understanding of the complex ways in which economic, political, and social practices intersect at multiple scales, Nebraska phase archaeology holds much promise to refine and redirect research that is less dependent on abstract concepts and functionalist interpretations, and more people-centered, inclusive, and responsive to multiple histories, traditions, and processes of change (Alt 2001; Brumfiel 2003; Pauketat and Alt 2003).

Research Questions and Directions

Timely research questions pertaining to the *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400* context can be arranged into the following six categories:

- Regional Settlement History (Population Displacement, Resettlement, and Migration);
- Making a Living: Subsistence Preferences and Practices;
- Cultural and Natural Landscapes;
- Material Culture, History and Meaning;
- Interaction, Exchange, and Conflict; and
- Development of Plains Anthropological Taxonomic Theory

Below is a brief discussion of each category and some directions for future research. The research questions presented below each topic are fluid, with new questions constantly arising and with some questions cross-cutting multiple topics.

Regional Settlement History (Population Displacement, Resettlement, and Migration)

Regional studies show that demographic reconfiguration and cultural pluralism were common in the late pre-Columbian world, including the eastern Plains. In the Loess Hills region alone, we see archaeological expressions of a number of similar, yet diverse lifeways and cultures, as well as what appears as abrupt movements, resettlements, or migrations. To date, most studies of regional settlement history have been concerned with broad-scale explanations that emphasize external factors and environmental parameters (resource abundance or scarcity; climate). While not to deny the importance of environmental constraints on culture expression and change, recently researchers have begun to explore resettlement, migration and population displacement as forces of cultural change (Pauketat 2003; Sassaman 1998; Stein 1998). Arguably, understanding the various cultural constructs in the Central Plains tradition may require new theoretically-informed perspectives that address, together, the physical movements of people, environmental constraints, and forces of cultural change that are internal and driven by historical processes, if not yet fully understood (Pauketat 2003:39). Recent applications of such concepts as short term sedentism (Nelson and LeBlanc 1986), household residential mobility (Varien 1999), and considerations of large scale population movements (Anthony 1990; Pauketat 2003) will no doubt have useful application in future studies of regional settlement histories in the Glenwood locality.

Research on regional settlement histories can be directed, with the refinement of regional and expanded pan-regional chronologies, towards questions about the temporal and spatial relations among the different phases and settlement localities for the Central Plains tradition. Research should be directed to determine where within the time span of the Central Plains tradition Glenwood locality sites fall and if the Nebraska phase cultures as they are known archaeologically derive from indigenous Late Woodland groups, or, in the case of the Glenwood locality, whole scale migration, cultural intrusion, or diffusion. Can the origin of the earthlodge as a specific architectural style be traced? Regional settlement studies should also continue to explore the spatial extent of Nebraska phase lodge sites beyond the Glenwood locality. Other timely research questions that may be addressed by archaeological examination of Iowa's Nebraska phase sites include:

1. Is there evidence for contact between Upper Republican groups and the Keg Creek earthlodge sites beyond ceramic indicators such as the high frequencies of collared rim sherds? Can lithic raw material source studies identify potential regions of movement of people or stones originating further to the west? What other traits differentiate the Upper Republican phase from Nebraska phase? How are these traits represented along Keg Creek? Would the Keg Creek earthlodge sites be classified as Upper Republican based on their traits if geography wasn't involved, and if not, what are the implications for construction of cultural phases of the Central Plains tradition?
2. What was the nature and extent of trade or contact with Steed-Kisker groups to the south in the early years of the Nebraska phase? Are there similar cultural contacts with other phases such as

Smoky Hill in Kansas? What was the spatial and cultural extent of influence between Nebraska phase sites and Steed-Kisker?

3. What was the extent of trade and contact with the Oneota during the later portion of the Nebraska phase in Iowa's Loess Hills (see Tiffany 2009)? Did contact with Oneota groups hasten the demise of local populations or their movement out of the area? Do we see evidence of Oneota influence on Central Plains tradition sites west of the Missouri River, besides the Fanning Site in northeast Kansas (see Ritterbush 2007)?
4. Are all of the mounds in the Glenwood locality Woodland or could some of them be attributed to the Nebraska phase? How do Nebraska phase mounds identified west of the Missouri River compare to Woodland mounds in that same area?
5. If scaffold burial was the predominant interment method, would this type of mortuary practice be evidenced in the archaeological record, other than the lack so far of finding large numbers of burials?
6. Are there Nebraska phase cemeteries in the Glenwood locality? Can information on the locations of Nebraska phase cemeteries west of the Missouri River (landforms, proximity to earthlodges, etc.) be used to develop a predictive model that could be applied to Iowa? And if so, could geophysical surveys be used to investigate predicted locations?
7. How can an integrated approach to the study of ceramic seriation, house location, use-life of structures, and a new suite of AMS (Accelerator Mass Spectrometry; a type of radiocarbon dating) dates be used to test ideas about regional settlement and community layout?

Making a Living: Subsistence Preferences and Practices

Lodge dwellings, shaped from earth not unlike the Loess Hills themselves, have much to tell us about traditional architecture, community layout, households, cultural values, and demographics. The interiors with their deep subfloor pits once filled with corn, bison scapula hoes, hide scrapers, fishing lures, and decorated pottery have much to say about everyday life, how people made a living, and their social and economic relations.

Nebraska phase peoples and their neighbors utilized or grew a similar suite of domesticated and wild native plants (sunflower, elderberry, bulrush, tobacco, and little barley) and tropical cultigens (corn, beans, and squash) and depended on a variety of wild animal resources, but practiced different types of agriculture and emphasized different kinds of wild resources. Nebraska phase people in Iowa may have practiced an extensive form of swidden (slash and burn) horticulture, where fields are cleared of timber and brush, burned before planting, and then allowed to lay fallow for long periods of time before reuse. Not too far away in northwest Iowa, Middle Missouri tradition peoples (the Mill Creek culture) practiced intensive field agriculture, investing labor in the preparation of ridged fields, perhaps to increase crop yield or buffer climatic effects. Future research should be directed to better understand the organization of production and productive relations and practices among Nebraska phase peoples living in the Glenwood locality.

For both the Nebraska phase and the neighboring Mill Creek economies, the scale of agricultural production did not involve an extensive land clearance for crops, but it did require an investment in land, such that the level of agriculture allowed for stability in settlement and ability to repeatedly cultivate the same locality. Research has demonstrated an association between intensive farming, settlement location, mobility, and land tenure (Jones 2005). By definition, intensive agriculture involves a high level of input per unit area of land, resulting in a high level of output, though not necessarily per capita (van der Veen 2005). In other words, Nebraska phase and Mill Creek people devoted a significant amount of time in their gardens, which were largely productive, but only on a scale that would satisfy a smaller group of people. Because of the high investment in preparing the garden area and working to produce a successful multi-crop of plants, it's unlikely that either culture would have moved their garden areas on a frequent basis. Rather it is suggested that farm plots were maintained for the duration of occupancy in the lodge, or about 7 to 10 years.

Different types of farming practices have different labor and technological needs and lead to different kinds of people-land-technology relations. Nebraska phase and Mill Creek groups may have used similar tools and natural resources—earth, mud, wood, stone axes—to construct their homes and villages, but did so in different ways and on different parts of the landscape. Nebraska phase peoples seem to have placed emphasis on smaller mammals and fish, while other groups focused on bison and avifauna (birds), presumably for both subsistence and manufacturing. Deer and elk along with smaller mammals, even rodent-sized ones, occur in varying quantities at Nebraska phase earthlodge sites and may reflect diversity in diet, but also periods of dietary stress resulting either from environmental (drought or soil depletion) or social (raiding and warfare) factors. Nebraska phase people used the bow-and-arrow and utilized a variety of stone and feathers to manufacture arrows, used undoubtedly for both hunting and warfare. The settlement pattern data suggest a demographic decline later in the Glenwood occupation. Researchers have postulated that the apparent population decline in the Glenwood locality may indicate that they were displaced by intrusive populations, or that environmental factors such as drought or soil depletion led to people moving out of the area. As archaeologists refine the occupational histories and practices of the many residential sites it will be possible to construct demographic cycles (upturns and downturns) that take into consideration both social and environmental causes, including droughts and their potential effects on resource depletion (tree harvesting, construction, soil fertility).

Resource depletion may have occurred, given the relatively high concentration of Nebraska phase sites in Mills County (Adair 2009). Given the concentration of recorded earthlodges within the county boundaries, and assuming that elm was the preferred wood for earthlodge posts (based on the identification of wood from the Millipede site, 13ML361; Schirmer 1996), it is possible that mature elm trees were exploited from riparian forests to the point of decimating this resource. Lodges dating to the latter part of Iowa's Nebraska phase sequence may therefore have been constructed with other local woods, or the loss of this critical resource may have contributed to the termination of Glenwood culture occupation in this region. Despite the abundance of various trees along the Missouri River and tributaries of western Iowa, there is a basis to assume that Nebraska phase people selected specific species of wood for various uses, from lodge construction to firewood to artifact manufacture.

The calcareous or non-acidic nature of the soils in western Fremont, Mills, and Pottawattamie counties tends to promote good preservation of floral and faunal remains on Nebraska phase sites. Therefore, archaeological excavations commonly encountered bone artifacts such as pendants, fish hooks, scapula hoes, deer mandible sickles, awls, harpoon points, and antler tine flakers (Figures E11 and E12). Nebraska phase populations also worked freshwater mussel shells into tools such as spoons, digging tools and scrapers. Shell effigy pendants and beads have also been reported. With proper recovery techniques, modern analyses of floral and faunal remains can yield considerable data about prehistoric diets and local species, and paleoenvironmental reconstruction studies can be more complete (e.g., Chumbley 1990).

Despite the generally good preservation conditions that have been noted for the Loess Hills, Nickel's (1973) analysis of botanical remains from several of the highway U.S. 34 sites excavated by Hotopp (1978a) was the only Glenwood locality archaeobotanical study until the 1990s. Asch and Green (1995:68) suggest that the paucity of archaeobotanical studies was due in part to use of only dry screening excavated soils and feature fills over relatively course mesh, precluding the possibility of recovering most floral remains that could be used as indicators of subsistence resources. In other words, early excavators sifted soils with large mesh screen, if it was screened at all, and did not employ soil flotation to capture the tiniest artifacts, like seeds.

Flotation processing of feature fills and other cultural deposits using fine mesh recovery screens is now common practice in archaeological research. As a result, new discoveries of exploited plant remains are occurring with greater frequency. The analyzed highway U.S. 34 artifact collection, plus assemblages from recently excavated sites 13ML175 and 13ML361, provide a glimpse into the kinds of plant resources used at earthlodge sites in the Loess Hills (Table E1). Nebraska phase populations exploited a broad spectrum of floral resources that may be tentatively grouped into domesticates, cultivated wild species, and collected wild species.

Table E1. Types of Identified Subsistence Plant Remains at the U. S. 34 Sites,† 13ML175,* and 13ML361.**

Domesticates	Cultivated Wild Species	Collected Wild Species
corn	little barley	amaranth
common bean	barnyard grass (possibly)	cordgrass
sunflower	knotweed	elderberry
goosefoot	marshelder	goosefoot (possibly)
gourd		panic grass
squash		porcupine grass
tobacco		purslane
		walnut

† Nickel 1973, cited in Adair 1988
* Asch and Green 1995:69
** Billeck 1992b

The commonly known prehistoric domesticates corn, beans, and squash, were undoubtedly important in the diets of Nebraska phase populations throughout the area, but the seeds of cultivated and collected wild species also contributed significantly. Some of the species that were important to prehistoric Nebraska phase people, such as little barley, are now extinct; others are considered weeds by modern people. It is likely that some species are common to many sites, while other species are unique or are found at only a few sites (Asch and Green 1995:69).

Curated archaeobotanical collections from Iowa's Nebraska phase sites may contribute in significant ways to current research topics on early farming strategies, use patterns of wild plant and tree resources, community structure and settlement patterns, loss or reduction of specific local resources, impact of prolonged droughts, and economic changes or impacts due to conflict. The ability for archaeobotanical remains to contribute to any of these topics ultimately depends on the quantity and quality of the curated samples, the amount of associated documentation concerning site context, the research value of these remains in association with other assemblages, and the complexity of the research questions being asked.

Adair (2009) reviewed curated archaeobotanical collections from 32 of Iowa's Nebraska phase sites. Her preliminary evaluation demonstrates that study of archaeobotanical collections can address specific research questions that would enhance our understanding of the economic adaptation of prehistoric farming on the eastern Plains. Sizeable amounts of wood charcoal from several sites are also valuable data in addressing issues of lodge material selection and potential resource depletion. A compilation of the archaeobotanical data would go well beyond a mere listing of what crops may have been grown, but would address research on responses to periodic drought, potential resource depletion (especially of select woods), and economic changes due to conflict. Some of this research is best approached at the specific site level, especially given the difference in recovery techniques. Other research however, is best approached by collectively viewing the entire archaeobotanical assemblage from all of Iowa's Nebraska phase sites as examples of a unique economic adaptation to the eastern Plains of North America. While both Mill Creek culture (Initial variant of the Middle Missouri tradition, in northwest Iowa) and Nebraska phase people practiced a level of intensive farming, differences in settlement patterns and the presence of fortifications and ridged fields associated with Mill Creek sites suggests that the overall subsistence pattern was not the same for both cultural groups.

Faunal remains, including mammal, fish, bird, amphibian, and reptile bone and mussel shell, were usually recovered in past excavations, but most analyses of the materials have been limited to identification of tools or ornaments (e.g., Anderson 1961). While faunal assemblages from Glenwood locality sites have not been systematically studied, a growing number of researchers are beginning to focus on faunal data for both paleoenvironmental information and prehistoric subsistence practices (e.g., Bardwell 1981; Cordell et al. 1995; Hirst 1995). As with floral remains, considerable intersite variability (in kind and quantity) is expected. Clear evidence of intensive bison exploitation has not been encountered in the Glenwood locality, but selected bison elements, such as scapulae, have been noted. Such elements were usually made into tools, and may have been acquired through trade.

Theler (2009) analyzed the faunal materials from the Wall Ridge site (13ML176), a Nebraska phase earthlodge. The fine-screen recovery methods employed at this site yielded finer-scale results than those done at older excavations and resulted in a targeted recovery of small scale faunal remains in large numbers. Wall Ridge is located immediately adjacent to the Missouri River trench and it is evident that the site occupants took advantage of locally available animal resources resulting in a faunal collection that differs markedly in aquatic species from the Nebraska phase Glenwood sites of the nearby Keg and Pony creek drainages. The Wall Ridge faunal assemblage with more than 100 vertebrate and invertebrate species represents a "time-capsule" for local and regional faunal communities during the human occupation at the site. Excavations at Glenwood locality sites in a similar setting would serve to validate and expand the observed faunal patterns at 13ML176.

Some examples of information gleaned from faunal remains at Wall Ridge include showing that some snail species recovered from the earthlodge are at the margin of their current range (e.g. *Gastrocopta procera*) and have experienced dramatic range extensions and contractions during the Holocene as a response to climate change. The distribution of species at adequately sampled and dated Glenwood locality lodges (perhaps combined with climatically sensitive small mammal species) hold great potential to signify the timing and impacts of late Holocene climate change on regional settings and by extension, regional human societies. Previously, the remains of fish were considered rare at most of Iowa's Nebraska phase sites. At the Lincoln 1 site (13ML119), Eshelman (1970) reported 55 fish bones; represented were gar and possible sturgeon and catfish. Wall Ridge is decidedly different with nearly 13,000 fish bones representing 20 identified species with an additional four probable identified species. This remarkable fish assemblage contains species associated with a wide range of habitats. The Wall Ridge site produced at least 12 leopard frog (*Rana* sp.) individuals. Some or all of the leopard frogs may represent dietary items harvested with other aquatic resources. As with the snail and fish remains, the exceptional recovery methods at Wall Ridge resulted in unparalleled recovery of small scale amphibian remains.Reptiles occur rarely at Iowa's Nebraska phase sites. Wall Ridge includes the remains of two snapping turtles (*Chelydra serpentine*). Adult female snappers are exceptionally vulnerable to human predation when laying their eggs on dry land in late May or early June. Cooking in the shell typically leaves exterior shell scorching, as seen on the large individuals from Wall Ridge. Additionally, one bone from a small painted turtle (*Chrysemys picta*) and five tiny snake vertebrae are also in the collection.

Cordell (2009; Green et al. 1990) analyzed bird remains from Wall Ridge and other Glenwood locality sites. He identified 27 species, including many dabbling ducks (*Anas* sp.), upland species such as turkey (*Meleagris gallopavo*) and prairie chicken (*Tympanuchus* cf. *T. cupido*), and a number of raptors that may represent species harvested for ritual purposes. Mammals are the best known class of animals at Glenwood locality earthlodge sites through the efforts of Dr. Holmes Semken and his students. The primary sources of animal protein came from bison (*Bison bison*), elk (*Cervus elaphus*), and deer (*Odocoileus* sp.). The large size of these animals may have resulted in their carcasses being skinned and partially or entirely deboned at their kill location with an underrepresentation of bones and number of individuals at

Glenwood earthlodges. A variety of smaller riparian mammals taken for food and/or fur are present at several sites. Small mammal remains, occurring naturally at Glenwood sites, permit detailed descriptions of the local setting and perhaps aspects of climate changes (Bardwell 1981; Croft and Semken 1994; Eshelman 1970; Johnson 1972).

Archaeologists agree that the economic foundation on which Nebraska phase societies rested was based on a combination of domesticates and wild resources. Domesticates included maize, chenopodium, little barley, beans, sunflower and squash. A variety of other wild foods were consumed, including nuts, seeds, and fruits, large game (deer and elk), and other aquatic (fish, turtle, mollusks), avian (bird), and terrestrial species (a multitude of small mammals, such as muskrat and rabbit). Questions remain about the role played by bison in subsistence economy. While hoes made from bison shoulder blades were used by Nebraska phase people in Iowa, there is relatively little evidence of bison remains that speak to subsistence or manufacturing-related processing in midden and pit deposits at Nebraska phase earthlodge sites. Also unclear is the nature, extent and scale of farming, particularly concerning maize and its role in Nebraska phase economy and society. The record shows a great deal of variability between and among lodges in terms of the quantities of recovered maize (Adair and Green 2008).

Research is currently directed to address a number of questions about historical processes, farming practices and social and economic contexts of wild and domesticated plants and animals. For example, did farming develop locally or as a result of outside influences? Was multi-cropping important? How were farming practices sustained over a roughly 150-year period in the Loess Hills region? How were food production, distribution and consumption practices organized within Nebraska phase communities and how do they differ from neighboring communities such as Mill Creek? Did Nebraska phase kin groups share in activities related to food production, storage, and consumption or did they compete with one another for resources, including land? Can periods of social or environmental stress be recognized in the botanical and faunal record? Were the social relations of food production communal or competitive? To answer this latter question will require an integrative approach that includes information on subsistence practices as well as the structure of basic social units, social and gendered relations of production and their related material culture (bison scapula hoes, end scrapers), storage practices, and community layout that speak to questions about social distance among households, uses of public and private spaces within households and communities, links between material culture and their contexts of value and meaning (see section below, *Material Culture, History and Meaning*), and transformations in land use and people-land relations (see section below on *Cultural and Natural Landscapes*).

Eastern Woodland peoples are sometimes referred to as gardeners and sometimes as agriculturalists, often without an accurate understanding of farming practices that were variously employed including poly cropping, shifting cultivation, and the production of surpluses. Some archaeologists (Blakeslee 1987) have suggested that the occurrence of ground stone axes at Glenwood sites may indicate swidden farming. An important avenue for future research will be to address the nature of variation in the subsistence data as it relates to

the organization of production and contexts in which maize and other cultivated foods were used or differences in the scale and organization of their production. There is not a full understanding of the role cultivated foods played in households and in different social and historical contexts and traditions, nor do we know to what extent 'farming' was entrenched in Nebraska phase household economies. Only by detailed study of food remains, their contexts of use and production, will it be possible to better define such terms as 'horticultural,' 'agriculture,' or 'farmer' that are variously applied to many late pre-Columbian societies. In the southeast, researchers focused on Mississippian societies have found that the same level of variation in scales of production and crop regimes evident in the historic period also existed prior to European contact (Scarry and Scarry 2005). Changes in uses of plants and animals (wild and domesticated) often involves changing cultural concepts, values and uses of material goods in economic, cultural and social spheres, all of which are historically contingent and often involve interacting with other people. Future research aimed at fine-tuning local and regional chronologies will be particularly important in order to trace influences that affected the adoption of maize cultivation in this locality, as well as the varying involvements in bison hunting among Nebraska phase societies. Some relevant research questions and issues that address topics of making a living, subsistence, and social relations of production include:

1. What types of bison bone are recovered from Iowa's Nebraska phase sites? Primarily scapula hoes? Is bison a large component of the diet? Do faunal assemblages tell us how they may have been obtaining bison? Were the hoes traded in? Were there long distance hunts?
2. Is the Glenwood locality the winter home of Central Plains tradition people who spent the summer on the Platte River?
3. What can the analysis of animal remains tell us about local terrestrial and aquatic habitats and how they were utilized by Nebraska phase peoples?
4. How can the rich faunal and botanical data together with their contexts and associations inform on seasonality of subsistence and related activities and site occupations? Are there seasonal differnences in the subsistence remains of upland versus bottomland lodge sites?
5. The combination of wild and cultivated plants may have contributed to more than half of the required daily caloric intake for the Nebraska phase earthlodge inhabitants. The historical importance of biannual bison hunts, linked to the flourishing fur trade of the 19th century, has often been used to explain the economy of Late Prehistoric Plains groups. Yet the available data suggest that the foundation of Nebraska phase economy was farming. Can analysis of the faunal and botanical record reveal the relative contributions of wild versus cultivated resources to the diet of Nebraska phase peoples?
6. What factors contributed to the observed variability in both kind and quantities of plant species among Nebraska phase earthlodges? Such factors as preferences, scale and intensity of production, changes in the use and processing of plants, seasonal procurement, change in diet over time, site preservation, recovery methods, and observer identification error can affect between-lodge variability. With the recovery of plant remains from a series of Nebraska phase earthlodges, we are in a better position to ascertain which of these factors may have been responsible for the observed variation.

7. Where are the farms or gardens? Was there a preference for floodplain or terrace gardens?
8. The scale of agricultural production did not involve an extensive land clearance for crops, but it did require an investment in labor to allow stability in settlement and ability to repeatedly cultivate the same locale. Would this have been possible in the Loess Hills? Loess soils are very productive, but without some method of water retention, farm plots may not have received enough moisture at critical times. Did the Nebraska phase people develop methods to pool precipitation or channel runoff? Were the gardens or farm fields positioned on landforms that helped support water retention?
9. Lodges in close proximity could represent repeated and/or prolonged occupation by an extended family (or kin group) due to an investment made in the soil productivity and/or water retention techniques. If these things were in place, there would be a high incentive to stay in the same place for as long as possible as a means of benefiting from the labor invested in the land. If this pattern were successful, there would be less of an incentive to move. With a significant number of AMS radiocarbon dates from archaeobotanical remains, the temporal association among lodges, especially those in close proximity, would help ascertain the relationship of the lodges to each other and a delineation of changes over time.
10. Accurate dating of each lodge, and the temporal relationship among lodges, is a critical component to a study of the Nebraska phase. The best, and probably the most accurate, dates are obtained by the AMS technique on annual plants. In addition to dating the lodge occupation, AMS dates on tropical cultigens can address the timing of the distribution of these crops and the cultural processes involved in the adoption of cultigens throughout the Plains and Eastern United States. Does the site contain plant remains which can aid in AMS dating?
11. Gender related activities or division of labor can sometimes be determined by the distribution of archaeobotanical remains and the location of certain artifacts and features within and immediately surrounding a lodge. Can careful and systematic recovery of plant remains and material culture demonstrate locations where plants were processed, prepared, and stored?
12. What is meant by intensive agriculture and how is this form of economy linked with land tenure to form an integrated system? How do the archaeobotanical data from Nebraska phase lodges contribute and support any such definition?
13. Were the well-made end scrapers commonly found on Nebraska phase sites used to scrape hides? Is there evidence that they were used in tasks other than hide scraping?
14. What contact materials were the distinctive Nebraska phase well-made, thin, leaf-shaped bifaces used on?
15. Given the rich material culture repertoire of Nebraska phase peoples who used shell, bone and presumably other materials not preserved in the archaeological record (e.g., animal skins, wood, gourds) to manufacture items for everyday use and possibly trade, can tools used for the manufacture of these unpreserved items be identified and differentiated from tools or tool industries used in other kinds of everyday or subsistence-related tasks?

16. If task-specific tools or tool industries (broadly, plant and animal processing; specifically, hide and shell working) can be identified in the archaeological record, what can the distributions of these tools and their manufacturing byproducts within and between Nebraska phase sites tell us about the context(s) of their production and use, and the organization of labor for inferred tasks at the household, community, and regional levels?
17. Can the number and volume of storage pits and ceramic breakage rates be used to estimate Nebraska phase house occupation duration (use life) and household size?
18. Can discard patterns, midden composition, and artifact frequencies be used to examine rates of midden accumulation over the course of time a Nebraska phase earthlodge was occupied?
19. Can identified wood charcoal from the site yield information about resource depletion trends?

Cultural and Natural Landscapes

Cultural landscapes are partly human created with inseparable natural and cultural components since they are always occupied by other humans and diverse biotic communities. Indian histories are full of place names, accounts of creation and migrations, and intertribal warfare that recount tribal histories, create and perpetuate identity and define homelands, territories, friends and foes (Nabokov 2002:126–127). Archaeologists have become increasingly interested in landscape approaches, particularly with recent developments in Geographic Information System (GIS) technology. With its multitude of earthlodge sites, the Loess Hills' Nebraska phase sites lend themselves well to the study of built and nonbuilt native landscapes.

There are cases where Plains archaeology and Indian oral histories converge, as in the case of the Hidatsa flaming arrow origin myth and the location of one of the oldest dated Plains Indian villages near the confluence of Turtle Creek and the Missouri River, a site called by descendant Indians, Charred Body Creek in North Dakota (Nabokov 2002:136–137). While ethnography and ethnohistories of historic Indians cannot be directly applied to their pre-Columbian ancestors, we can assume that people-land relations were equally infused with meaning and history and just as flying over the plains today tells us about modern agricultural practices and land values, a bird's-eye view of the Missouri River valley landscape in A.D. 1250 would reveal similar insights. We would see clusters of earthlodges along drainage terraces, on the tops of ridges, or along the bank of the Missouri River, where once the spring flood waters subsided, the bottom lands would be covered with a newly deposited blanket of fertile silt ready for planting. Would the lodges on the bottoms be larger than those on the ridge tops? What is the spatial distribution and association between different sized lodges? Does variation in lodge size help to understand family structure and cycles, or extent of involvement in productive activities? Can we identify summer and winter lodges that depict seasonal patterns in landscape or locations of gardens or agricultural fields relative to domiciles? To what extent does landform affect settlement patterns or spacing between lodges? Can we see a historical progression of settlements from the lower reaches of drainages to their headwaters and northward from the Platte confluence towards Kullbom Hollow? Was the environment able to support farming communities over a roughly 150-year period? What kinds of social or symbolic meanings, traditions, or cultural and historical influences might be signified in earthlodges as a unique architectural style? These are just some of the

questions that can be framed from a landscape approach to Nebraska phase. Other research questions include:

1. Which earthlodges were contemporaneous? This may be established through cross-lodge refitting of bone, ceramics and stone.
2. What was the function of the isolated lodges up and down the Missouri River, away from the Glenwood locality? Were these pioneers? A part of a travel, communication, and/or trade network? Are these early, middle, or late sub-phase sites?
3. Are we missing an entire suite of Nebraska phase sites, ones buried or destroyed on the Missouri River floodplain?
4. The Glenwood locality is of significance in that it was the subject of one of the first applications of computer modeling in archaeological settlement patterns. The model's significance lies in its acceptance by scholars of the Glenwood "Culture" as a plausible test of the relatively short occupational duration of the Nebraska phase in the locality, as opposed to other such models. The computer model remains relevant today because it challenges us to think of the population dynamics and social organization that pertained to the locality. Its assumptions concerning matrilocal residence, survivorship profiles, infant mortality, resource depletion, lodge lifespan, and lodge spacing remain testable in the archaeological record, with the advantage of over 30 years subsequent research into these subjects and more advanced modeling technologies, in particular GIS. The short duration and small extent of the Glenwood Locality lend it significance as a "laboratory" for anthropological study and archaeological application of such models. Can Nebraska phase sites aid in updating these computer models?
5. Is there evidence that climate change affected settlement patterns in the Loess Hills during the Nebraska phase occupation?
6. Why are some lodges so much larger than others? Are isolated lodges more likely to be larger than houses that are part of a tight lodge cluster? Are houses bigger in the bottoms than the ridge tops? If so, why?
7. How does the distance between lodges change on various landforms? Is there a correlation between lodge size and number, function, and size of storage pits within and surrounding the lodge?
8. How are Nebraska phase earthlodges similar to and different from other semi-subterranean dwellings in other North American pre-Columbian contexts? The development of the Plains earthlodge culminated in the Late Prehistoric village cultures of the Missouri River valley. The Nebraska phase lodges are important as an early example of earthen architecture that was adopted in various forms throughout North America. How did utilization of such houses vary through time and space? How do Nebraska phase lodges fit into those patterns? Did such factors as population density, sedentism, subsistence practices, or climate affect the adoption and use of earthlodges?

Material Culture, History and Meaning

Nebraska phase archaeology offers an unprecedented opportunity to explore differences in the way people use culture to express beliefs about themselves and the world they inhabit. The physical remains of Late Prehistoric Nebraska phase settlements are not only unprecedented in their numbers but in the well-preserved dwelling sites that offer clues to how people lived, worked and interacted. The richly preserved material record boasts not only of the mundane everyday items needed to make a living, but the esoteric items that speak to connections with the secular world and beliefs of other peoples and places. Buffalo, deer, and raptors provided materials for clothing, tools for tilling the land, and items used to trade with neighbors near and far. It is here that we see the earliest use of bison scapula hoes, commonly used among the historic Plains Indians to till the land. We find intricately carved fishing effigies (perhaps pendants or lures) from shell. Archaeologists studying the Loess Hills are beginning to unravel the varied uses and forms of decorated and undecorated vessels used to prepare, cook, store, and serve food. The importance of feathers and talons from eagles and hawks, so prevalent in Plains Indian culture, has perhaps its earliest expression in the archaeological record of the Late Prehistoric period in the Loess Hills. Stone scrapers and bone awls speak to the importance of hide products among the Nebraska phase peoples and perhaps varying degrees of involvement in exchange of animal hides or finished products.

Perhaps one of the hallmark artifacts of Plains villages are hoes made from buffalo shoulder blades, the 'bison scapula hoe;' an item that is also found at Nebraska phase sites. Some Hidatsa women posing for early photographers chose to hold their bison scapula hoes, and hoes as such played a role in ritual enactments of the Mother Corn Ceremony among the Arikara even after they had been replaced by metal hoes (Nabokov 2002:151–152). Personal testimony of a Northern Cheyenne woman tells of marking the handle of her hide scraper with the ages of her children stating that:

> Throughout my 92 years it has always been part of my most precious pack...I was carrying it in my hands when my husband was killed on upper Powder River...It was in my little pack when we broke out from the Fort Robinson prison. It never has been lost. ...When I die, this gift from my husband will be buried with me (Marquis 1978:80).

As the examples above richly illustrate, material culture is active not passive, not isolated but associated, and the contexts in which we find objects in archaeological deposits help refine our understandings not only of technology and economy, but of historical interactions, identities and value-laden meanings. Nabokov (2002:156) writes:

> From the earliest trade transactions between American Indians and Euro-Americans, what people wore, the tools they used, and how they adorned themselves registered all of these historical changes and altered value systems. The pace and intensity with which their material, social, and political lives were transformed by horses, glass beads, trade cloth, metal wares, firearms, and the like can yield rich "implicit documentation" of many kinds of histories.

Non-local chert used to manufacture certain types of tools and bison scapula hoes are suggestive of interaction with neighboring groups to the west and north, whereas ear spools, notched arrow points, discoidal stones, ceramic animal effigies, seed jars and water bottles with particular design motifs are associated with Mississippian societies to the south and east. It is generally thought that Mississippian influence at Nebraska phase sites was indirect rather than direct, whereas Mill Creek and Mississippian interaction is argued by some to be of a more direct nature. Both of these postulations remain untested and may hinge, in part, on a refined ceramic chronology and certainly more detailed evidence on production, distribution and exchange of the items in question.

End scrapers were manufactured on thick flake blanks with a narrow ovoid or tear-drop outline and were presumably used for hide processing. Results of a pilot study indicate that these forms were used intensively to scrape hides (Pope 2009). Scrapers are often tied to trade in animal skins and often signify the labor of wives, daughters, and other female kin, as do clam shells used to shell corn and hoes for tilling the land. On the other hand arrow points used for hunting or warfare, or axes for clearing land and constructing shelters tend to signify activities of husbands or sons and warriors (Figures E13 and E14). By examining the frequencies, associations and contexts of these items, commonly found in Nebraska phase earthlodge sites, we can not only access activities that may correspond to particular social relations defined by age and sex, but we can also ask questions that address value and meaning infused in activities, technologies and other material items, from preferred cherts used to make hide scrapers or bison shoulder blades for hoes, to the intricately carved clamshell fish-shaped pendants and falcon imagery that challenge archaeologists to explore deeper meanings and histories tracked by objects like initiations, war deeds, status, life transitions, and death (Nabokov 2002:161). While the methods to probe these spheres of the material world in deep history may elude archaeologists, to see a hide scraper, awl or hoe only as a means to an end or exchange commodity is an injustice to the people whose lives, livelihoods and histories we seek to translate through their own material residue.

Given the potential for certain items (medicine bundle bags, falcon feathers and talons, shell beads, particular ceramic vessels and design motifs) to have deep collective or individual meaning, histories, or ritual use, it is hard to imagine these types of objects as passively signifying trade-based ideologies or exchange commodities. It is not hard to imagine them as personal or collective items for ritual uses, such as the consolidation of related groups under adverse conditions, or as collective symbols that record some aspect of a shared tradition, memory, or history, perhaps commemorating a war deed, legitimating access to power, or as regalia for particular circumstances such as ritual dances requiring regalia. In this regard it is of interest to note that Mississippian-related long-nosed god masks, when found in excavated contexts, are associated with limestone discs, conch shell, galena and pigments (Bareis and Gardner 1968:498). When found in mortuary contexts they tend to occur in pairs behind the ears, an interpretation that is supported by an engraving on a pipe from the Spiro site in Oklahoma (Williams and Goggin 1956:32–35).

Nebraska phase utilitarian ceramics include globular jars, broad shallow bowls, and narrow-mouthed seed jars. The earthenware vessels were presumably produced by coiling or mass modeling a paste of clay tempered with grit, sand, or crushed mussel shell, followed by malleating with a cord-wrapped paddle. The cord-roughened pots were often partly or completely smoothed over. Decoration was applied to the rim exterior, consisting of incising, tool or fingertip impressing, or occasionally pinching or noding. Bodies were usually left undecorated. The early Glenwood culture ceramic analyses (Anderson and Anderson 1960; Anderson 1961; Anderson and Whitworth 1977; Ives 1955) employed variations of Gunnerson's (1952) original classification scheme in which sherds and vessels are classified by vessel type, with subtypes based on decorative treatments. Four wares/vessel types are recognized (Figure E15): McVey (direct jar rims), Beckman (collared jar rims), Swoboda, (collared and channeled or S-shaped jar rims) and Debilka (bowls, seed jars). The variety of vessel forms was once thought to be sufficient that seriation analysis would yield a temporal ordering of sites. Anderson's (1961) seriation resulted in a three-phase sequence of occupation in the locality. Zimmerman (1977a) used a similar approach, but concluded the typology was not sufficiently sensitive to permit successful seriation efforts, and called for a re-evaluation of the typology. Later researchers (Billeck 1993; Blakeslee and Caldwell 1979) relied upon attribute analyses for seriation purposes.

Nonutilitarian ceramics found on Nebraska phase components include miniature pots, spoons or ladles, pipes, and figurines. Pipes were tubular or elbowed and occasionally decorated with incising or anthropomorphic or zoomorphic effigies. The pipes suggest the use of tobacco among Glenwood locality populations. Ceramic figurines have been found in human, waterfowl, and turtle forms. McNerney (1987) postulated complex relationships between Nebraska phase populations and Mississippian, Caddoan, and southwestern populations as the impetus for the production of the figurines.

Billeck (1993) has suggested, and Tiffany (2009) concurs, that pots with shell tempered paste appear both early in the occupation of the locality due to the influence of contemporary Mississippian/Steed-Kisker phase populations, and late in the occupation through contact with or influence by Oneota groups. The influence of Mississippian related, or later Oneota groups, is also reflected in body sherds with trailed/ incised line motifs or chevrons that were placed on the shoulders of a few vessels at early or late sites (Billeck 1993:247–249). Sherds with cord impressed decoration similar to Late Woodland Missouri Bluffs Cord Impressed ware occur in low frequencies throughout the occupation of the region.

Nebraska phase sites may address research questions that relate to the topic of material culture, history and ideology, including:

1. Assuming that both notched and unnotched triangular projectile points were used to tip arrows for hunting and weaponry, are there particular use-wear patterns that differentiate between notched and unnotched styles of arrow darts?
2. Are there preferences for particular raw materials for particular types of tools used in particular kinds of tasks?

3. Do thin well-made bifaces, well-made endscrapers, notched arrow points and chert hoes co-occur on Nebraska phase sites and in similar quantities?
4. In what kinds of deposits or contexts are end scrapers and bi-pointed bifaces found at Nebraska phase sites? Are they ubiquitous? Are they continuous among sites, drainages or over time or do some types drop in or out of the archaeological record at particular places or times?
5. How can ceramic attributes (ware type, decoration, etc) and depositional context be used to identify functional variability in Nebraska phase ceramic vessels?
6. How can petrographic analysis of ceramics from Nebraska phase sites be used to identify and differentiate between local copies of certain vessel types and those acquired through contact and interaction with other groups?
7. How can more detailed studies of Mississippian material objects found at Iowa's Nebraska phase sites, their composition, associations, design elements, depositional contexts, and inter-lodge distributions provide a richer understanding of the role and meaning of these objects in the lives and histories of Nebraska phase people, which in turn, may provide a better understanding of why they are there and how they may have gotten there?

While the notion that Mississippian objects may reflect participation in adoptive rituals between Mississippian polities and Glenwood locality residents early in the Nebraska phase occupation sequence may be valid (Alex 2000; Henning 2007; Tiffany 1991a, 1991b), the function of such rituals to establish presumably reciprocal trade relations remains to be demonstrated. Nor do we understand the uses, meanings or cultural implications of these various Mississippian objects (gaming stones, items of ideological and cosmologically-charged items for personal adornment and ritual regalia) among Nebraska phase communities. Did playing the chunky game signify political communities and shared experiences similar to those evidenced at Cahokia, regardless of whether contact was direct or indirect? Does the appearance of particular sets of Mississippian objects signify a "pan-regional extension of the same historical process evident at Cahokia proper," a retelling of "central stories of the ages with their own inalienable cultural objects" (Pauketat 2005:206)? If the occurrence of Mississippian objects across the Midwest has more to do with historic processes at Cahokia and less to do with controlling exchange, how can we redirect enquiry to explore these alternatives as they relate to processes of interaction, exchange, and conflict?

Interaction, Exchange, and Conflict

Since no communities exist in isolation, studies of the interactions among communities form an important part of an anthropological understanding of social, economic and political relations. Glenwood cultural manifestations offer a rich laboratory for the study and interpretation of how people interacted with each other, their neighbors, the land, and people from more distant places. Through the rich material culture repertoire of Nebraska phase peoples it is possible to explore regional variations in interactions among indigenous peoples and their interactions with the Late Prehistoric world as it was known at the time. To date, interaction has been examined principally from the perspective of exchange. Elaborately decorated ceramic vessels bearing motifs associated with Mississippian cultures to the south and east, particularly the

Steed-Kisker site in Missouri, and other Mississippian objects speak to the social use of material items in spheres that may have pertained to play and warfare, personal adornment, shared cosmologies, and perceived uses of ceramic vessels and particular design motifs for particular activities or contexts of use. There is ample evidence in the archaeological record that Late Prehistoric agricultural societies in the major interior rivers were interacting, however the contexts in which these interactions took place remain elusive and the subject of much archaeological discussion and debate.

Nebraska phase peoples lived in unfortified, dispersed farmsteads, practicing subsistence gardening and producing a variety of items for personal use as well as items that may have circulated in some form of trade or exchange, or to secure alliances. These practices raise questions about changes in the internal organization of production and labor, external relations and interaction, and the uses of material cultural to form identities, alliances or to bestow prestige and power.

Another type of interaction evidenced in the archaeological record, but which has received little attention by scholars, is conflict. Archaeologists, until recently, have tended to gravitate toward interpretations of cultural change and interaction that rely on generalized and abstract functional models that emphasize system maintenance rather than change and disruption. Yet both the archaeological and ethnographic records speak to raiding and warfare as a form of cultural interaction. Nebraska phase sites may address research questions that relate to exchange, interaction and conflict issues, including:

1. If there are use-determined preferences for particular raw materials, where do these materials originate and in what stage of manufacture are they being acquired or transported?
2. Can a comparative study of morphological variation in maize plants identify groups interacting with one another involving the transport of cultigens? Maize morphology (cob and kernel) is often used to identify maize types and establish cultural relationships among groups growing the same type of maize. In the Central Plains, the best approach to determining archaeological maize types is to record the quantitative attributes, such as cob length, cob diameter, pith diameter, row number, cupule width and kernel thickness, and qualitative attributes, such as cob shape and degree of row pairing, for all maize remains. The more samples recovered and measured, the greater the ability to identify different varieties of maize. Comparisons of the Nebraska phase maize to surrounding areas may identify where trade or other relationships occurred.
3. How can petrographic analysis of ceramics from Nebraska phase sites be used to identify and differentiate between local copies or purported trade vessels suggestive of contact and interaction with Mississippian, Mill Creek, or Oneota groups?
4. How can more detailed studies of Mississippian material objects and motifs found in Nebraska phase assemblages, including their composition, associations, and depositional contexts, provide a richer understanding of the role and meaning of these objects in the lives of Nebraska phase people, which in turn, may provide a better understanding of why they are in Iowa's Loess Hills and how they may have gotten there?

5. Warfare and violence changes the way people live and introduces nutritional and environmental stressors. Can an integrated approach to the study of settlement patterns, material culture, and mortuary data using GIS technology help to identify the human face and material consequences of warfare or violence during the Nebraska phase occupation?
6. Can tool attributes combined with spatial studies shed light on technologies of warfare and violence?
7. Do the skeletal elements recovered from domestic contexts in Nebraska phase sites evidence instances of violence, stress, or conflict?

Development of Plains Anthropological Taxonomic Theory

One intriguing aspect of Late Prehistoric earthlodge sites is the role they have played in the development of cultural systematics employed by archaeologists studying the Plains region of North America. The information gathered from these sites led to the development and continuing refinement of Late Prehistoric cultural taxonomic models by archaeologists working throughout the Plains. These models were originally developed as an attempt to define the cultural relationships between known historic tribes and the prehistoric groups who occupied the Plains. Excellent detailed histories of the evolution of taxonomic models have been published elsewhere (Gradwohl 1969; Krause 1989; Lehmer 1971). Examining these histories illustrates the development of anthropological scientific theory during the twentieth century. Viewing these histories in relation to the investigations that have occurred at Glenwood locality earthlodges illustrates how sites in this area could play a vital role in answering specific questions concerning cultural relationships of the defined Late Prehistoric groups throughout the Central Plains.

The first known investigations of any Late Prehistoric earthlodge sites in the Central Plains occurred in the Glenwood locality (Proudfit 1881a, 1881b). While these early investigations identified a significant concentration of earthlodge sites in the area, professional investigation of these sites in Iowa lagged behind the rest of the Central Plains region. The lack of professional investigations and similar lack of timely dissemination of data from these sites led to a low level of integration of the data from Iowa in early models of prehistoric cultural relationships within the Central Plains. With the definition of the Nebraska Culture in the early twentieth century and its perceived ties to known historic groups who occupied the Plains, archaeologists began working on a direct historic approach in developing cultural sequences of the area's prehistoric past. Continued early twentieth century investigations in central Nebraska later identified sites, known as Upper Republican, that contained several similar traits, but which also showed obvious differences in material culture.

The growing body of data led to the establishment of the first taxonomic system employed in the Plains, the Midwestern Taxonomic System (McKern 1939). This system was based solely on material content and was utilized and modified for decades. As more sites were investigated in the mid-twentieth century, archaeologists realized the complexity of defining cultural relationships would require a model that included integrative factors of time and space, as well as content. This was primarily in reaction to the fact that original classifications could not account for sites that showed combinations of traits that were initially used

to segregate cultures as they were originally defined. These "hybrid" sites appeared to represent the influence of time and geographic location on speculated cultural relationships. The gradual acceptance and modification of the Willey and Phillips (1958) taxonomic model in the 1960s led to a refinement in the perception of the dynamics of cultural relationships of the prehistoric inhabitants of the Central Plains. Complexities of the process of gathering data and integrating it into theoretical models designed to explain these dynamics dominated archaeological research in the Plains during the mid-to-late twentieth century. The resultant model identifies a wide ranging Central Plains tradition that is comprised of local phases. Phases may represent specific populations or related groups but their exact interactions remain unknown. The Nebraska phase is geographically limited to eastern Nebraska, western Iowa and possibly a sliver of land along the Missouri River in northeastern Kansas.

Due to a lack of professional investigation of earthlodge sites in western Iowa prior to the 1950s, the relationships of these groups with the more thoroughly investigated sites in Nebraska remained relatively unknown. Their range within western Iowa is still debated but the concentration of these sites within the Glenwood locality is undeniable (Hedden 1997). Subsequent professional investigation and the analysis of materials recovered from earlier avocational work performed in the Glenwood locality revealed that material culture complexities that played a vital role in the development of taxonomic classifications modeled for the central plains existed within this limited geographic area (Anderson 1961; Billeck 1993; Brown 1967). Sites that met the original definition of the Upper Republican phase have been identified within the Glenwood locality. The implications of the presence of these types of sites in this area have not been adequately explained and await additional analysis.

While taxonomic models of Late Prehistoric earthlodge sites have undergone dramatic changes over the course of the last century, their conception and application have had a common goal: to better illustrate cultural relationships among identified prehistoric populations. With a growing body of data to work with, these models continue to evolve. Basic goals and questions posed, however, still have not been met or remain unanswered. The relationships between the identified prehistoric groups that occupied the Central Plains region and historic tribes are still not fully understood. While material culture differences were originally used to differentiate between phases of the Central Plains tradition, the implications of these variations are still unknown. One interesting feature of the Glenwood locality is that major differences noted for the vast region covered by the Central Plains tradition appear to be present within this limited geographical area. Basic questions concerning the origin of the Central Plains tradition, the origin of the use of the earthlodge, the role of identified ceramic variation in defining affiliation, the extent of contacts with groups from other defined traditions, and the eventual abandonment of the region can be addressed from this limited geographic locality. A better understanding of these factors within the Glenwood locality will undoubtedly provide answers that have far-reaching implications for the greater Plains region of North America.

Nebraska phase sites may address research questions that relate to Plains taxonomic issues, including:

1. Sites that were excavated by avocational archaeologists in the 1930's (i.e., 13ML64, 13ML67 and 13ML79) recovered material culture assemblages that could be classified as Upper Republican phase of the Central Plains tradition. The material culture from a majority of sites in the Glenwood locality fits more closely into the defined Nebraska phase. The presence and implications of these "Upper Republican types" of sites in the Glenwood locality have never adequately been explained. The relationship of the Upper Republican and Nebraska phase populations are still poorly known. Do these sites reflect a co-existence of Upper Republican and Nebraska phase populations in the Glenwood locality or do they reflect sequential occupation?
2. Over a majority of the Central Plains region, the development of the Central Plains tradition appears to be an abrupt change from previous settlement and subsistence patterns with no clear antecedents in the development or adoption of the earthlodge. Can the presence of earthlodge sites containing material cultures of different defined phases of the Central Plains tradition in a limited geographical area outside of the general spatial patterning of these types of sites (i.e., east of the Missouri River) provide evidence concerning the origins and development of the Central Plains tradition over the entire Central Plains region?
3. The location of the Glenwood locality on the Missouri River immediately east of the mouth of the Platte River would provide this population with a unique position to control or monitor the transport of trade goods moving north and west (and conversely south and east) of the area. Occasional exotic artifacts are recovered from sites in this area. Is the presence of Central Plains tradition populations at this location related to a desire to control trade into and out of the Plains? Can the potential objects of trade (bison scapulas, lithic resources from the Flint Hills and central Nebraska, etc.) be identified? Does controlling regional trade have an influence on the presence of material culture reflecting different identified phases of the Central Plains tradition?
4. Professional archaeological investigations of prehistoric earthlodge sites the Central Plains in the early-to-mid-twentieth century led to the definition of the Central Plains tradition and various labels applied to the populations that were identified as leading a similar lifestyle across a wide geographical area and temporal span. These taxonomic classifications were intended to define cultural relationships among populations. As the complexity of identifying what constituted a determinant for a cultural division grew, the development of a taxonomic system based solely on content gave way to a system that attempted to integrate material content with factors of time and space. As professional investigations and detailed reporting of the content from sites in the Glenwood locality lagged behind the broader area of the Central Plains region, these sites played only a modest role in the development of the current systematics employed in describing Late Prehistoric populations. Can a detailed study of the variation in the material culture present at Nebraska phase sites in Iowa's Loess Hills provide a method to better integrate factors such as space (horizon) in the taxonomic systems developed to describe cultural relationships throughout the entire Central Plains region? Can we use data from these sites to dispel the notions of isolated phases occupying defined geographical areas that are demarcated by arbitrary lines drawn on maps?

F. Associated Property Types

Earthlodges, mortuary facilities, and artifact scatters have been defined as property types for the historic context *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400.* One site may reflect aspects of more than one property type, where an earthlodge also served as a mortuary facility. The property type descriptions, associated registration requirements and significance are presented herein. Several other related property types may exist, but have not yet been identified. These other property types are not developed in this MPDF, but may include lithic workshops, quarries, agricultural field remnants, butchering sites, other temporary camps, ceremonial sites, and rock art.

All resources associated with the identified context are archaeological in nature, and are counted as sites. Given the high quantity of archaeological work around the City of Glenwood in Mills County over the past 75 years, there has been much inadvertent duplication of site numbers. Billeck (1992a, 1992d) and Willman (2009) did a great deal to correct these errors. Wherever possible, known site duplicates are omitted from this discussion.

All Central Plains tradition sites in Iowa are of the Nebraska phase, with 275 of these sites identified (Table F1). These include 226 sites with one or more earthlodges, 18 mortuary facilities, and 44 artifact scatters. Thirteen of the mortuary facilities are associated with an earthlodge. Because several of the earthlodge sites contain more than one verified earthlodge, the total number of identified Nebraska phase lodges from all 226 of the earthlodge sites is 298.

Table F1. Nebraska Phase Property Type Site Counts in Iowa (as of January 10, 2010).

Property type	Site count	Totals
Earthlodge site	**226**	
with identified human remains	13	
lacking identified human remains	213	213
Mortuary facilities	**18**	18
associated with an earthlodge site	13	
not associated with a specific earthlodge site	5	
Artifact scatter (not associated with any of the above)	**44**	44
Total identified Nebraska phase sites		275

Six Central Plains tradition sites are National Historic Landmarks (de la Vega 2003). The Whiteford (Price) Site is in Kansas, and the other five National Historic Landmarks are in the State of Nebraska.

- Ash Hollow Cave (25GD2)
  - includes Archaic, Woodland, and Upper Republican components
- Coufal Ridge Site (25HW06)
  - either Itskari or Upper Republican; 22 excavated earthlodges
- Leary Site (25RY2)
  - an amalgam of Central Plains tradition (Steed-Kisker and Nebraska phases) and Oneota traits, features and artifacts; at least two lodges
- Signal Butte (25SF1)
  - primarily Archaic, but includes an Upper Republican component
- Walker-Gilmore Site (25CC28)
  - includes Archaic, Sterns Creek Woodland, and Nebraska phase components
- Whiteford (Price) Site (14SA1, 13SA414)
  - Smoky Hill phase; 12 to 15 known earthlodges; burial ground containing at least 151 individuals

In addition to the six National Historic Landmarks listed above, there are 26 Central Plains tradition sites or districts listed on the National Register of Historic Places (NRHP):

Nebraska phase site or component, all but two in the State of Nebraska:

- Pony Creek Park (in Iowa)
- Doniphan Site (in Kansas; 14DP2)
- Ashland District (includes Nebraska phase sites)
- Champe-Fremont Complex (25SY1, 25DO1)
- Fontanelle Forest Historic District (includes Nebraska phase sites)
- Frank Parker Site (25WN1, 25DO169)
- Kurz Omaha Village (25SY14)
- Nehawka Flint Quarries District
- Patterson Site (25SY31)
- Schrader Site (25LC1, Nebraska or Smoky Hill phase)
- Theodore Davis Site (25CC17)
- Troyer Site (25SW24)

Upper Republican phase or component, two in Kansas and the others in Nebraska:

- Pottorff Site (14LA1, in Kansas)
- Walsh Archeological District (includes Upper Republican phase sites in Kansas)
- Big Blowout Site (25KH67)
- Lost Creek Site (25FR6)
- Mowry Bluff Site (25FT35)
- Cunningham Site (25NC10)

Itskari phase, in Nebraska:

- Ellie Mae Site (25SM20)
- Sweetwater Site (25SM4)

Smoky Hill phase, in Kansas:

- Minneapolis Site (14OT5)
- Mugler Lodge Site (14CY1-A)
- Table RockSite (14PW1; Smoky Hill or Nebraska phase)

St. Helena phase, in Nebraska:

- Indian Hill Archeological District (all St. Helena phase sites)
- Schulte Site (25CD1)
- Wiseman Site (25CD3)

There is one Central Plains tradition resource in Iowa listed on the NRHP. Pony Creek Park, just northeast of the City of Glenwood, was nominated as a site in 1971 . This "site" designation seems to be an error; it should have been nominated as a district, as Anderson (1971) included two sites within the park's boundaries. He did not mention the site numbers, but states there are two or more lodges within the park. Information gleaned from Iowa's version of the National Archaeological Database (NADB-Iowa 2000), based on the NRHP form, lists Anderson's two sites, 13ML207 and 13ML225, along with a third lodge, 13ML429, which was not discovered until two decades after the NRHP listing. Close examination of the site locations reveals 13ML207 has been inundated by a reservoir, and 13ML225 is not actually within the park confines. Anderson's (1971) Pony Creek Park Statement of Significance is reproduced below:

> The archaeological significance of Pony Creek Park rests upon the existence of two, and possibly more, prehistoric earthlodge sites within the confines of the park. These house sites, identified as components of a Central Plains tradition community, are the only examples of such houses presently located on public property where they might be preserved and protected, and perhaps serve as the basis for an interpretive center for the archaeology of this region. There are no compact villages during this phase of the Central Plains tradition; houses were irregularly distributed over the landscape. If attention is to be properly directed to this significant prehistoric cultural unit ,which once occupied the Missouri Bluffs in Iowa, it must be on the basis of one or two house locations. Pony Creek Park is located in the center of the only area in southwest Iowa where archaeological investigations have been conducted. It would be very appropriate to designate the park, with its prehistoric house sites, as an area included in the National Register of Historic Places.

Outside of Iowa, the historic context *Late Prehistoric Native American (Central Plains Tradition, Nebraska Phase) Settlement of the Lower Platte River Valley-Missouri Bluffs Vicinity, ca. A.D. 1000–1400* has been developed within the MPDF *Archeological Resources of the Metro Omaha Management Unit: Cass, Dodge, Douglas, Sarpy, Saunders, and Washington Counties, Nebraska* (Pepperl 2006). The geographic area of that MPDF is limited to a six-county portion of Nebraska near and including Omaha. The Patterson Site, a Nebraska phase habitation, was nominated and NRHP-listed in conjunction with filing of that MPDF.

Property Type #1: Earthlodge Site

a. Description

An earthlodge site consists of one or more Nebraska phase dwellings and their associated features (see Figures E5-E9). The vast majority of known Nebraska phase sites in the Iowa Loess Hills are of Property Type #1: 82.1 percent of the known Nebraska phase sites are earthlodge sites (226 of the 275 sites). Earthlodge sites may also include mortuary facilities (Property Type #2): 5.8 percent of the earthlodge sites are also classified as mortuary facilities (13 of the 226 lodges sites). Details of earthlodge layout and construction are provided in the Historic Context, Section E; a summary is presented here.

Arguably, this property type, "earthlodge site" could be divided into two categories: dispersed lodges and earthlodge clusters, which was the organizational format taken in a Nebraska phase sites MPDF in a six-county area of Nebraska (Pepperl 2006). This tack was not taken for the present MPDF. Due to variability in site recording practices since the inception of the Iowa Site File in 1959, two earthlodges separated by 20 m could just as easily be recorded under a single or two separate site numbers. Twenty-five of the recorded earthlodge sites have definitely contained more than one earthlodge (Table F2).

Table F2 lists all earthlodge sites in the Iowa Site File. Numbers in parentheses indicate the known or estimated number of earthlodges at a site. Lack of parentheses signifies one earthlodge is assumed or verified to be present. Boldface indicates the site is also considered Property Type #2, a mortuary facility, due to the presence of human remains (excluding deciduous teeth; discussed later). Note that sites 13ML137 and 13ML138 are included in the earthlodge list. Although only storage pits or a few post molds were identified at those sites, Hotopp (1978a) believed these features probably were associated with earthlodges.

Many of the known Nebraska phase lodges have been partially excavated or tested by either amateur, professional, or academic archaeologists. Billeck (1993:10) found that at least 130 earthlodges have been excavated by archaeologists or interested laypersons, with several sites excavated by both groups. Archaeologists have partially or completely excavated and analyzed the remains from 41 Nebraska phase earthlodges. Avocational archaeologists have excavated between 103 and 106 earthlodges, with the results of at least 27 of those excavations partly described.

Table F2. Nebraska Phase Earthlodge Sites in Iowa (bold face indicates dual categorization as a mortuary facility site).

13FM24	13ML100	13ML191 (2)	13ML254	13ML312	13ML412
13FM36	13ML102 (2)	13ML192	13ML255 (7)	13ML315	13ML413
13ML1	13ML104	13ML199	13ML260	13ML318	13ML418
13ML2	13ML106	13ML203	13ML262	13ML319	13ML419
13ML5	13ML107	13ML204	13ML263	13ML320	13ML420
13ML9	13ML109	13ML205	13ML265	13ML323	13ML421
13ML10 (5)	13ML111	13ML206 (6)	13ML267	13ML324	13ML423
13ML11	13ML112	13ML209	13ML268	13ML325	13ML424
13ML12	13ML116	13ML210	13ML270	13ML342	13ML425
13ML13	13ML118	13ML211 (2)	13ML272	13ML343	13ML426
13ML15	13ML119 (4)	13ML214	13ML274	13ML344	13ML427
13ML20L	13ML120	13ML215	13ML275	13ML345	13ML429
13ML22 (10)	13ML121	13ML216 (2)	**13ML283**	**13ML360**	13ML431 (3)
13ML24	13ML122	13ML218	13ML284	13ML361	13ML432
13ML26	**13ML124**	13ML219 (3)	13ML285	13ML362	13ML433
13ML27 (3)	**13ML126**	13ML220	13ML286	13ML367	13ML434
13ML28	**13ML128**	13ML222 (7)	13ML287	13ML368	13ML435
13ML32	13ML129	13ML223 (7)	**13ML288**	13ML369	13ML436
13ML34 (2)	**13ML130**	13ML225	13ML289	13ML372	13ML438
13ML37	13ML131	13ML226	13ML290	13ML374	13ML455
13ML38	13ML132	13ML227	13ML291	13ML376	13ML456
13ML40 (2)	13ML133	13ML228	13ML292	13ML377 (2)	13ML457
13ML51	**13ML134**	13ML229	13ML293	13ML390	13ML459
13ML56	**13ML135**	13ML230	13ML294	13ML391	13ML475
13ML57	13ML136	13ML231	13ML295	13ML392	13ML495
13ML64	13ML137	13ML232	13ML296	13ML393	13ML535
13ML66	**13ML138**	13ML233	13ML297	13ML394	13ML554
13ML67	**13ML139**	13ML234	13ML298	13ML395	13ML555 (2)
13ML68	13ML142 (2)	13ML235	13ML299 (2)	13ML396	13ML558
13ML73	13ML145	13ML236	13ML300	13ML397	13ML560
13ML74	**13ML155**	13ML237	**13ML301**	13ML398	13ML561
13ML79	13ML170	13ML238	13ML302	13ML399	13ML578
13ML81	13ML174	13ML239	13ML303	13ML401 (5)	13ML647 (4)
13ML82	13ML175 (2)	13ML240	13ML305	13ML402	13ML652
13ML87	13ML176	13ML241	13ML306	13ML406	13PW205 (6)
13ML92	13ML179	13ML243	13ML307	13ML407	13PW206 (6)
13ML96	13ML189	13ML244	13ML308	13ML409	
13ML98	13ML190	13ML252	13ML309	13ML411	

In general, amateurs' excavation work is very poorly documented, and few excavations would meet modern professional archaeological standards. The quality of amateur work was variable; typically almost no information is known about amateur excavations, but a few amateurs provided notes and even detailed maps of what was excavated. Other lodges have been excavated by professional or academic archaeologists; the quality of this excavation information can also vary. Early academic excavation notes contain almost no information, while later professional archaeologists can be quite detailed with notes and maps.

This high volume of work is both a positive and negative: much is known about these sites, but many have been disturbed. Unless prior destruction is well-documented, many partially excavated properties may still contain features or feature remnants. Even where destruction is thought to have been complete, such as at some 1930s-excavated earthlodges, peripheral features, such as outdoor activity areas or middens, may still remain, given the preference for lodge-only excavations (Figure F1). Willman (2009) reviewed site reports, period correspondence and the Iowa Site File in an attempt to better understand impacts to earthlodges. He found that 48 percent ($n = 109$) of the 226 known earthlodge sites are probably completely destroyed, primarily by construction or professional or avocational archaeological excavations, and 14.6 percent ($n = 33$ sites) were between 50 and 100 percent destroyed. Several sites (23.9 percent; $n = 54$ sites) have not been investigated since the 1930s, the location is poorly known, or work at the site has been so minimal that assessing site condition is presently impossible. The remaining 30 earthlodge sites or 13.4 percent of the known earthlodge sites, appear to be between 50 and 100 percent intact.

It is nearly impossible to identify Iowa Site File earthlodge sites where the only subsurface disturbances are cultivation-related. Most of the sites in Table F2 have been subsurface tested by professional or avocational archaeologists, or have been disturbed by looting or construction activities (Willman 2009). Site 13ML647 is one of the exceptions: four probable earthlodges have been recorded there on the basis of surface collections (Whittaker and Newman 2010). Cultivation is the only known site disturbance. A few earthlodges have seen very modest disturbances, in the form of minimal archaeological testing. Less than one percent of the site area at the Beier Earthlodges Site (site 13ML102) has been subsurface tested by archaeologists. Apart from surface collections, minimal archaeological testing, and modest cultivation effects, the site is in excellent condition. Site 13PW206 is another example, with six lodges identified there on the basis of surface depressions. Apart from cultivation and the excavation of twenty-one 20-cm-diameter auger tests by professional archaeologists (Whittaker and Newman 2010), this site apparently remains undisturbed.

The variety of disturbances at other earthlodge sites runs the full range of possibilities, from modest disturbances to complete destruction. Many sites were in or adjacent to highway U.S. 34 construction (Figure F2). Some were completely destroyed, others only partially disturbed. For instance, most of the lodge depression at 13ML120 was reportedly removed during access road construction in the 1970s. The site was relocated and tested in 1991, and portions were still intact (Billeck 1992d). Billeck also revisited 13ML155 which corresponds to locations investigated by Rowe (Rowe's site C14), Orr (Lodge X-38),

and Hotopp (1978a). Billeck (1992d) noted that a housing addition at the Glenwood Resource Center sits atop this lodge location, presumably destroying it. Other earthlodge sites which may have been completely destroyed include 13ML243, 13ML495, and 13ML555.

It must be noted that, once a site number is accepted into the Iowa Site File, it is never removed. Numbers are sometimes "retired," when, for example, a site number is inadvertently assigned to a location which already has a site number, or where a site number was assigned to a paleontological location, such as a fossil find, where there is no evidence for human occupation. Sites that are destroyed, however, remain part of the Iowa Site File because they represent a location where human activity is known to have occurred in the past, and that therefore continue to be important parts of the scientific and historic record. Therefore, Site 13ML155 is still listed as an archaeological site, even though physical traces of it may be completely obliterated from the landscape.

Central Plains tradition earthlodges of the Nebraska phase are semi-subterranean, square to rectangular structures. A pit was excavated to form the floor. Usually, timber framing supported a wattle and daub covering. Often, the entryway is sloping and forms a hall-like appendage to the house, often facing southeast or southwest. Earthlodge floor area varied greatly, from 28.4 to 171.8 m^2, suggesting a variety of household sizes (Crismon and Green 1991, 1992a-b; Hotopp 1978a, 1978b). This same general description holds throughout the Central Plains tradition, with local variations noted according to phase. Even within the Nebraska phase sites there is variation in lodge orientation, size, and other construction details. Two styles of Nebraska phase lodges have been identified. Style I is characterized by vertical wall posts around the house pit perimeter. Style II lacks these posts, suggesting rafters rested on the edge of the pit, forming a steeply sloped, combination roof and wall (Bozell and Ludwickson 1999:16–17). In Iowa, Style I predominates.

Archaeological evidence of earthlodges takes the form of one or more of the following features: post-mold alignments, compacted floors, deposits that signify earth lodge collapse or burning, hearths, storage pits, and/or clusters of artifacts. Surficial artifact concentrations or large quantities of daub may signify the locations of shallowly buried earthlodges. Some earthlodges have been reported as basin-shaped surface depressions. Many have been discovered during construction activities, primarily road and building construction.

Features exterior to the lodges, but associated with those houses, also exist. These features include storage pits, both for food and non-food items; refuse pits; hearths; outdoor shelters seen as post mold alignments (such as shaded deer processing locations with post supports); and refuse middens. Such a situation occurred at 13ML175, where three pit features were encountered but no definitive traces of an earthlodge were found. Morrow (1995:1) interpreted the large assemblage of lithic, ceramic, bone and botanical remains as "extra-mural activity and refuse disposal in dispersed sheet midden that was peripheral to nearby houses." He speculated that an earthlodge was probably present, but outside of his excavation area.

Mortuary facilities have been identified in association with 13 earthlodge sites. These are discussed in detail under Property Type #2.

b. Significance

Perhaps nowhere in the Midwest and Plains regions are there more dense concentrations of late prehistoric dwelling sites than in the Loess Hills near the modern City of Glenwood. Traces of prehistoric earthlodges were once so numerous there that archaeologists refer to their builders as the Glenwood culture peoples, an informal name for the Nebraska phase of the Central Plains tradition. Today, 226 earthlodge sites have been identified, with most of these found in the roughly 14-x-5-km (9-x-3-mile) stretch of the Loess Hills surrounding Glenwood. Not only is this area the hub of settlement for Nebraska phase peoples east of the Missouri River, but the Glenwood locality earthlodges likely represent the emergence of the Central Plains tradition on the east edge of the Plains (Roper 1995:214).

Earthlodges of the *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400* context are significant storehouses of information about all aspects of the lives of Central Plains tradition peoples (Criterion D). The well-preserved stratigraphic horizons, lodge remnants, storage pits, activity areas, and richly diverse artifact assemblage at earthlodges provide immense research opportunities into important questions of Central Plains tradition origins, population displacement, resettlement, and migration; subsistence preferences and farming and hunting practice; cultural and natural landscapes; materiality of economy, cultural expression, and conflict; Native Indian built landscapes; and establishment of cultural identity.

Nebraska phase earthlodge sites may be designated at three progressive levels of significance: local, state, and national. If a nominated resource is significant at a national level, by default it is also significant at the local and state levels. Likewise, a site significant at the state, but not national, level is also locally significant.

Local Significance

Some sites are significant at the local level. These sites contain information that contributes to understanding of local patterns or local interests, but lack evidence that relates to broader statewide or national issues. Scientific or depositional integrity may be severely compromised, but sufficient data remain to answer locally pertinent questions, such as cultural affiliation or site age. These earthlodge sites may be considered eligible for the NRHP on a local level. Such severely compromised sites can be considered a contributing element in conjunction with a multiple property listing of other Nebraska phase sites holding state or national levels of significance.

State Significance

Earthlodge sites significant at the state level contain features or artifacts that relate to broader statewide or regional cultural patterns, but that lack data that relate to national issues. These sites may address some of the research questions set forth in this MPDF, but lack sufficient integrity to address the majority of them.

For example, earthlodge sites that once contained one or more intact houses, but which have moderately compromised depositional integrity may still be considered significant on this level if the potential to address a variety of statewide or regionally important research questions is present. The differences or similarities of constructed features among Nebraska phase peoples may be important in understanding statewide varieties of prehistoric house construction. Earthlodge sites of statewide signficance may be considered a contributing element in conjunction with a multiple property listing of other Nebraska phase sites holding a national level of significance.

National Significance

Earthlodge sites that have the potential to address all or most of the research questions set forth in this MPDF can be considered for nomination at a national significance level. To address all or most of these questions, the site may be slightly disturbed, for example, by cultivation or previous archaeological excavations, but must maintain sufficient depositional and historical integrity for the house layout and form, and interior or exterior activity areas (which include, but are not limited to, storage pits, house floors, and discrete artifact scatters that represent a specific activity, such as butchering or stone tool making) to be discernible. If this integrity is present, then the potential for recovering the scientific data needed to better understand the prehistory of the United States will be obtainable. Earthlodge sites with recognizable, well preserved features may be significant at a national level of significance as they often aid in understanding of broad patterns of prehistory that are otherwise difficult to discern. The absence of depositional integrity will preclude nomination at a national level of significance, although the site may be considered eligible for the NRHP at the state or local level.

Nomination: West Oak Forest Earthlodge Site (a.k.a., site 13ML652)

TheWest Oak Forest Earthlodge Site (a.k.a., site 13ML652) is being nominated as a property associated with the historic context *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400* (Peterson and Whittaker 2010). This MPDF was written with the intention that the present study will nominate the West Oak Forest Earthlodge Site and future studies will nominate other properties associated with the historic context. This MPDF should be expanded and amended as needed to better reflect additional contexts. Likewise, additional property types may be added by future studies.

Identification of Integrity Requirements

The requirements for integrity were derived from the documented condition of similar properties. Literature review aided in determining what conditions of preservation are required for site data to significantly contribute to our understanding of Central Plains tradition culture, particularly, the Nebraska phase in Iowa.

c. Registration Requirements

To be considered for nomination to the National Register of Historic Places under the historic context, *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400*, an earthlodge site must demonstrate it possesses all of the following criteria:

1. Location within the defined geographic area.
2. Nebraska phase age.
3. Research potential.
4. Integrity.

1. Location within the defined geographic area

The earthlodge site is within the MPDF's defined geographic boundaries, very roughly defined as the Loess Hills of Fremont, Mills, and Pottawattamie counties. Detailed geographic boundaries are provided in Section G of this MPDF. Spatial boundaries of the geographic area may be adjusted by future discoveries.

2. Nebraska phase age

Archaeological investigations should demonstrate that the earthlodge site dates to the Nebraska phase, sometime between A.D. 1250–1400. This connection may be demonstrated through a variety of means, including, but not limited to, radiocarbon dating, ceramic cross-dating, and the presence of pottery or other artifacts diagnostic to Nebraska phase peoples. Initial and terminal dates could be adjusted by future discoveries.

3. Research potential

Archaeological investigations should show that the earthlodge site has the potential to contribute to better understanding of the local Late Prehistoric history, regional issues of Nebraska phase cultures and/or national trends regarding the Central Plains tradition. Research potential can be identified from the subtopics discussed in Section E. These subtopics include the categories of:

- Regional Settlement History (Population Displacement, Resettlement, and Migration);
- Making a Living: Subsistence Preferences and Practices;
- Cultural and Natural Landscapes;
- Material Culture, History and Meaning;
- Interaction, Exchange, and Conflict; and
- Development of Plains Anthropological Taxonomic Theory

4. Integrity

The requirements for integrity were derived from the documented condition of similar properties. Literature review aided in determining what conditions of preservation are required for site data to significantly contribute to our understanding of the Central Plains tradition, particularly, the Nebraska phase.

In the guidelines and criteria set forth by the Department of the Interior for the National Register of Historic Places (National Park Service 1998, 1999, 2000), integrity is a key component to any site evaluation be it archaeological or architectural in nature. Integrity is defined as "the ability of a property to convey its significance" and "to retain historic integrity a property will always possess several and usually most of the aspects" of integrity (National Park Service 1998:44). The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association.

The National Park Service (2000:35-36) specifies that, "Location, design, materials, and association are generally the most relevant aspects of integrity under Criterion D...Under Criteria C and D, integrity of setting adds to the overall integrity of an individual site and is especially important when assessing the integrity of a district. Integrity of feeling also adds to the integrity of archeological sites or districts as well as to other types of properties. Integrity of setting and feeling usually increases the 'recognizability' of the site or district and enhances one's ability to interpret an archeological site's or district's historical significance."

Therefore, for earthlodge sites, integrity of location, materials, and association are of primary importance when nominating sites under Criterion D. Integrity of design, setting, workmanship, and feeling can also add to the site's integrity, although they are not critical aspects in this context. A plowed site can retain sufficient integrity if it has discernible activity areas or patterning associated with the period of significance and if it possesses good integrity of setting, materials, and association.

Property Type #2: Mortuary Facility

a. Description

In the late 1960s into the 1970s, American Indian groups were increasingly speaking out for equal rights and self-determination. Objections were raised about the long common practice of displaying American Indian human remains in museums. Concerns were expressed about the protection of the physical remains and spirits of their ancestors. Within this rising national activism, the American Indian Movement (AIM) was founded in 1968.

In the early 1970s, extensive archaeological investigations were undertaken as part of U.S. 34 highway work in the Glenwood area, crossing east-west through the Loess Hills. Several graves were encountered during this work. At one site (13ML126), the graves of Euroamerican settlers were disinterred and immediately reinterred in a nearby cemetery, but the grave of an American Indian was boxed up and

shipped back to the lab for study, along with artifacts from the project. Maria Pearson (Running Moccasins), Yankton Sioux, heard about this unequal treatment and was extremely upset. Outrage over this incident spurred her to become an active, and vocal, advocate for Indian rights and burial protection for the next three decades, not just within Iowa, but also nationally and internationally.

This and several other events in the early 1970s led to Iowa's "first in the nation" state laws passed in 1976 specifically providing legal protection for all burials, regardless of age and whether on public or private land. The 1976 law also provided for the reburial of ancient remains, defined by law as more than 150 years in age, and the establishment of cemeteries on state land to use for these reburials. The Office of the State Archaeologist was given statutory oversight of ancient human remains and burials. An Indian Advisory Council was formed to work with the State Archaeologist on burial-related matters across the state. Multiple meetings were held in the following years to bring Indian activists and archaeologists together to share respective points of view and issues related to burials. Working together, with concessions on both sides, and a developing respect for differing views over the years has made Iowa a national leader in burial treatment. The possible Central Plains tradition 13ML126 burials were one of three focal points (with the others near Council Bluffs and Sioux City) in the Loess Hills that were instrumental to enacting changes in the Iowa legal code and creating the precedent that led to similar legal changes in other states and presaged the 1990 passage of the federal Native American Graves Protection and Repatriation Act (NAGPRA).

Mortuary facilities at Nebraska phase sites in Iowa consist of burials outside of lodges; a flexed burial from a storage pit within a lodge; the remains of an individual who may have been crushed within a collapsed lodge; isolated mandibles or cranial fragments that have been found in storage pits or scattered in an earthlodge; a femur fragment from an earthlodge, and teeth that have been recovered from a variety of contexts. Other human remains have been found, but sometimes erroneously associated with the Nebraska phase, due to the presence of Nebraska phase lodges built atop or adjacent to a Woodland burial mound.

Mortuary facilities comprise 6.5 percent of the known Nebraska phase sites (18 of the 275 sites; Table F3), including 13 earthlodge sites (Property Type #1) and five sites that are primarily burial locations (i.e., not directly associated with a specific Nebraska phase house). Although all of the mortuary facility sites have seen some disturbances, none of these sites can be documented as completely destroyed.

Mortuary facilities that are not associated with earthlodges are very poorly understood in terms of feature distribution and burial practices. Perhaps the most detailed excavation at one of these sites was by Abbott (1980). An isolated burial had been disturbed by landscape construction at 13PW3 and was salvaged by archaeologists from Iowa's Office of the State Archaeologist (OSA). This probable male, aged 30–40, had been buried with freshwater clam shells, marine shell beads, and Swoboda ware, possibly a single vessel. Some of the ceramic sherds were clustered near the head. Flaking debris (refuse generated during the making of chipped stone tools) was also found, although its association, if any, to the burial is not known. Due to the extreme level of disturbance, little more was learned about interment.

Table F3. Nebraska Phase Mortuary Facility Sites in Iowa (* signifies human remains are of dubious Nebraska phase affiliation).

Within Earthlodge sites		Primarily mortuary
13ML124	13ML135	13ML14*
13ML126*	13ML138	13ML117*
13ML128	13ML139	13ML364
13ML130	13ML255	13ML387
13ML134	13ML283*	13PW3
13ML155 or 13ML288	13ML301	
	13ML360	

Other mortuary locations include 13ML387, where the landowner reported that human remains from burials were uncovered during bulldozing, stored, and turned over to an archaeologist 19 years later (Lillie 1992a, 1992b). At least three adults had been interred there. Details of burial are not known. At 13ML364, Rowe salvaged human bone and a drilled conch shell following construction of a pipeline in 1963 (ISF). No further information about this find is available. In fact, at all three of these sites, 13PW3, 13ML387, and 13ML364, it cannot be said that an earthlodge was absent.

The other type of mortuary-only-facility in the Iowa Site File is an unsubstantiated category: Nebraska phase burial mounds. There is no direct evidence that Nebraska phase peoples east of the Missouri River buried their dead in existing mounds or constructed mounds for this purpose. Sites 13ML14 and 13ML117 are burial mounds where the site recorder may have thought human remains and Nebraska phase materials recovered from a mound were deposited by the same people. A local collector dug into a mound at 13ML14 and reported he found human remains, bone beads and a triangular projectile point. These latter items are consistent with use during the Nebraska phase (Iowa Site File). Site 13ML117 is the Wells Mound Group. Orr's 1938 excavation at one of the five mounds noted the presence of a hearth, burial pit, "Glenwood aspect pottery" and 11 human crania fragments and other poorly preserved human remains (Orr 1942a:5–6, 176–180, 184). Reanalysis of the retained materials and Orr's (1938) notes suggests a Nebraska phase habitation site may have been at the same location as Woodland era mounds (Schermer et al. 1998:262–264). There is no conclusive evidence that the Nebraska phase materials were found in direct association with any of the human remains. Burials associated with 13ML283 are more likely Woodland than Late Prehistoric. Site 13ML283 once included at least four burial mounds, which are thought to be Woodland, and an adjacent Nebraska phase earthlodge (Billeck 1992a, 1992d; Lillie 1992a, 1992b). Nebraska phase peoples utilized the areas atop and adjacent to existing, Woodland-era burial mounds for other purposes. A similar case is probable at 13ML43, the Hunt Mound Group. Orr (1942a:173–174) noted that "Glenwood aspect culture" pottery found there seemed to be an intrusion, and not associated with Woodland burials. Given that Orr was able to recognize this separation, 13ML43 is not included as a Nebraska phase mortuary facility. Earthlodge site 13ML229 is, however, very near the mound.

There are numerous mortuary facility sites of uncertain age in the MPDF geographic area; some may be related to the Nebraska phase occupation, but no artifacts diagnostic of the Glenwood culture have been found at those sites. One example is 13ML612. Fishel (1998) identified a burial pit during mechanical blading of a proposed housing construction area. He noted that the mortuary facility was probably associated with the Nebraska phase occupation. His presumption was based solely on the fact that this site is located on the grounds of the Glenwood Resource Center, where other Nebraska phase sites have been identified. There was no evidence of an earthlodge in the 0.3 ha (0.7 acre) bladed area. A 196-x-206-cm (77-x-81-inch) soil stain extended about 10-cm (4 inches) below the plowzone and contained human remains. There were three bone concentrations at 13ML612, representing the interments of at least two individuals. Teeth, a mandible, long bones, and bone fragments were noted in the field, but all were placed back in the burial pit, soil returned to the pit, and it was protected from future construction impacts by the placement of metal fence posts around the burial feature. No grave goods or other artifacts were noted in association with this burial. Apart from its location in the Glenwood locality, there is presently no confirmatory evidence that this site is associated with the Nebraska phase.

More is known about mortuary facilities within earthlodges. Mortuary facilities at Nebraska phase sites in Iowa primarily consist of fragmentary human remains that have been recovered from storage pits or within the soil matrix from house interiors. Excavation and recordation methodologies run the gamut of those discussed under earthlodge sites, from meticulous note taking and excavation by stratigraphic levels, to complete plunder.

The only known complete burial from within an earthlodge was excavated by Hotopp (1978a:157–159; Fisher 1978). His complete excavation of an earthlodge interior (13ML135) identified seven storage pits, one of which contained human remains. The skeleton was complete or very nearly so. This 40+ year old woman had been buried in a flexed position on her side. Stratigraphy of the pit suggested it had been used for typical storage purposes. A layer of approximately 5 cm of sterile soil was then added to the pit, and the body laid on this. There was no obvious covering atop the body, and the pit was subsequently used for refuse. The pit was on the west side of the interior of the house, only a few centimeters in from the exterior wall. If standing at the doorway facing inward, the burial was on the side to the left of the entryway. The pit was slightly bell-shaped, with the orifice measuring 1.1 m (3.8 ft) wide, with a 1.2 (4.0 ft) diameter, and 0.8 m (2.7 ft) deep. No information was provided regarding grave goods, or the type of materials found above or below the body. These artifacts, but not the human remains, are stored at the OSA, and it may be possible to better understand the other artifacts found in the storage pit through reexamination.

The other complete burial from an earthlodge may not be an intentional burial at all. A complete skeleton was found lying on the floor of the lodge when State Hospital residents excavated either site 13ML155 or 13ML288 (Billeck 1993:115; Crimson and Green 1992:66–70). Orr (1942a) speculated this person was killed when the lodge collapsed on top of them. The disposition of the remains is not known.

A historic cemetery, believed to have been a related to the former town of Pacific City, was located at the same spot as a Nebraska phase earthlodge, 13ML126. Graves of 27 historic settlers were recovered. One of these burials attracted a good deal of attention, although little documentation has been found about the actual discovery of the grave of the individual who became known as the "Glenwood Princess." Newspaper accounts at the time reported the remains were of a young woman believed to have been Potawatomi, although no evidence for this affiliation was provided. A brief description of grave goods found with the remains support a historic burial (Billeck 1993:67–70; *Council Bluffs Nonpareil* 1971; *Omaha World Herald* 1971; Zimmerman 2005:61), and its placement within one of the mapped rows of graves indicate its association with the historic cemetery (Billeck 1993:70). Three teeth were recovered from within the earthlodge representing an older adult, an older juvenile or young adult, and an infant (Schermer 1982a). Four cranial fragments were also recovered from four different stratigraphic levels in three different units (Lillie 1990). No age or sex estimates were possible. Seven of the historic graves, representing both adults and subadults, intruded into the earthlodge. The teeth and cranial fragments may have come from these historic individuals or they may represent Nebraska phase inhabitants of the lodge.

Cranial fragments are the second most frequent human element found within an earthlodge. Rowe's excavations at the lodge at 13ML301 yielded fragments from at least one adult cranium (Lillie 1992a:160). His work from another lodge site, probably 13ML134, yielded the remains of a cranium from a probable young adult (Lillie 1992a:158). No further locational information about these finds are known. Rowe also recovered a single human cranial fragment from a location that was either 13ML203 or 13ML220, and another from either 13ML184 or 13ML258 (Lillie 1998a, 1998b). Because the information about these finds is so sketchy, they are excluded from Table F3.

Human mandibles were found in two separate earthlodges. Hotopp's (1978a:136–142; Fisher 1978) complete excavation of an earthlodge interior (13ML128) yielded a human mandible, probably from a male aged 20–25. This jawbone was found in a basin-shaped storage pit that measured 1.1 x 0.9 m (3.8 x 3.0 ft) and extended 0.5 m (1.6 ft) deep. This pit was situated on the interior of the lodge's west side. This location would be immediately opposite the entryway. Also recovered from this pit were an animal tooth, another 10 non-human bone fragments, a piece of shell, hematite, 19 ceramic sherds, and 13 pieces of flaking artifact. Hotopp's (1978a:146–152; Schermer 1982b) complete excavation of another earthlodge interior (13ML130) yielded the remains of one adult, along with two deciduous teeth from two separate individuals. The teeth both were found in bell-shaped Storage Pit 5. The adult evidence was in the form of a mandible fragment with one complete and one broken tooth attached. It was not found in association with a specific pit feature, but was within the interior of the house. It may be possible to review excavation notes to find out where, precisely, this mandible was found.

Teeth are the most commonly found human remains within Nebraska phase lodges. However, the loss of deciduous teeth is a routine occurrence in childhood, and deciduous teeth likely represent inhabitants of lodges who grew to adulthood. Found in isolation, they should not be considered a mortuary event.

Deciduous-teeth-only have been identified at four sites, none of which are considered mortuary facilities and are not included in the mortuary facility count or on Table F3 (13ML118, 13ML155, 13ML175, 13ML176; Fisher 1984; Hotopp 1978a:160–162; Morrow 1995:35; Perry 1987a; Schermer 1982a-f, 1984, 1987a). Note that a deciduous tooth and a femur fragment were found at 13ML139, and that site is included as a mortuary facility due to the femur.

Permanent (adult) teeth could also be lost through natural processes, but given the presence of adult cranial and mandibular fragments in several Nebraska phase lodges, these may also have served a ritual or other function. The presence of human remains in the form of permanent-teeth-only is considered an indicator of a mortuary facility, for the purpose of this historic context. Sites in this category are limited to 13ML124, 13ML138, and 13ML360. Site 13ML360 was excavated by an avocational archaeologist. Among the earthlodge remains was a single molar from an older juvenile or young adult. No futher information about its provenience is known (Lillie 1992a). An adult's molar was found in an earthlodge's storage pit at 13ML138 (Schermer 1982c). A molar, possibly from an older young adult, was found in association with the earthlodge at 13ML124 (Fulmer 1974a:90), but its exact location within the lodge is not known. Human femur fragments may be related to this site, but their association is tentative at best, with a note on a box containing the remains stating "Barrow [sic] Pit C" (Lillie 2003). Another tooth, this one adult and charred, was found by Rowe either at 13ML193, 13ML255, or 13ML247 (Lillie 1992a:158). Because the information about these finds is so sketchy, they are excluded from Table F3. Finally, the earthlodge at 13ML139 yielded the proximal two-thirds of a femur from the general soil matrix of an earthlodge (Schermer 1982d), possibly from an adult female.

Recovered Nebraska phase human remains are oftentimes isolated elements, so very little can be said about disease and cause of death. Very little is known about quantity and types of grave goods, for the same reason. Perhaps the near absence of pure mortuary facilities is most striking: the present evidence suggests there were not formal, below-ground cemeteries in the Loess Hills of Iowa during the Nebraska phase occupation. Perhaps scaffold burial was the predominant interment method. The occurrence of skull fragments within earthlodges, especially the cranium and mandible, may suggest ritual use of these items.

b. Significance

Unlike the dense concentration of earthlodges around Glenwood, Nebraska phase mortuary facilities are extremely rare in Iowa, consisting mostly of isolated human remains, such as cranial fragments, scattered within an earthlodge floor or in a storage pit. Researchers have suggested between 200–500 Nebraska phase people resided in the Glenwood locality at any given time during their roughly 200 year occupation of the area (Alex 2000; Billeck 1993; Wilson 1978). Yet only 18 mortuary facility sites have been identified, and four of these are of questionable Nebraska phase affiliation. Because so little is known, mortuary facility sites hold immense potential to learn more about Central Plains tradition people, illness, ceremonialism, conflict, population migration; material culture; and establishment of cultural identity (Criterion D).

Several kinds of properties are not commonly considered eligible for listing in the National Register: religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, commemorative properties, and properties achieving significance within the past 50 years. These kinds of properties may be eligible if they meet special requirements, called Criteria Considerations. Criteria Considerations do not apply to the present MPDF, because "except for the graves of significant historic individuals, burial places nominated under Criterion D need not meet the special requirements of the Criteria Considerations" (Potter and Boland 1992:14).

Nebraska phase mortuary facility sites may be designated at three progressive levels of significance: local, state, and national. If a nominated resource is significant at a national level, by default it is also significant at the local and state levels. Likewise, a site significant at the state, but not national, level is also locally significant

Local Significance

Some sites are significant at the local level. These sites contain information that contributes to understanding of local patterns or local interests, but lack evidence that relates to broader statewide or national issues. Scientific or depositional integrity may be severely compromised, but sufficient data remain to answer locally pertinent questions, such as cultural affiliation or age. These mortuary facility sites may be considered eligible for the NRHP on a local level. Such severely compromised sites can be considered a contributing element in conjunction with a multiple property listing of other Nebraska phase sites holding state or national levels of significance.

State Significance

Mortuary facility sites significant at the state level contain features or artifacts that relate to broader statewide or regional cultural patterns, but that lack data that relate to national issues. These sites may address some of the research questions set forth in this MPDF, but lack sufficient integrity to address the majority of them. For example, mortuary facilities which have moderately compromised depositional integrity may still be considered significant on this level if the potential to address a variety of statewide or regionally important research questions is present. The differences or similarities of burial features among Nebraska phase peoples may be important in understanding the variety of burial practices within the state. Sites that aid in understanding exchange patterns also may be significant at the state level, and the analysis of trade goods within mortuary facilities, may aid in undertanding those patterns. Mortuary facility sites of statewide signficance may be considered a contributing element in conjunction with a multiple property listing of other Nebraska phase sites holding a national level of significance.

National Significance

Mortuary facility sites that have the potential to address all or most of the research questions set forth in this MPDF can be considered for nomination at a national significance level. To address all or most of these, the site must maintain sufficient depositional and historical integrity for the mortuary facility form to be

discernible, be this an isolated grave, ossuary, human remains used as a cultural artifact, or other, yet undefined form. If this integrity is present, then the potential for recovering the scientific data needed to address a wide variety of research questions of national importance will be obtainable. If this integrity is present, then the potential for recovering the scientific data needed to better understand the broad prehistory of the United States will be obtainable. The absence of depositional integrity will preclude nomination at a national level of significance, although the site may be considered eligible for the NRHP at the state or local level.

c. Registration Requirements

To be considered for nomination to the National Register of Historic Places under the historic context, *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400*, a mortuary facility site must demonstrate it possesses all of the following criteria:

1. Location within the defined geographic area.
2. Nebraska phase age.
3. Research potential.
4. Integrity.

1. Location within the defined geographic area

The mortuary facility site is within the MPDF's defined geographic boundaries, very roughly defined as the Loess Hills of Fremont, Mills, and Pottawattamie counties. Detailed geographic boundaries are provided in Section G of this MPDF. Spatial boundaries of the geographic area may be adjusted by future discoveries.

2. Nebraska phase age

Archaeological investigations should demonstrate that the mortuary facility site dates to the Nebraska phase, sometime between A.D. 1250–1400. This connection may be demonstrated through a variety of means, including, but not limited to, radiocarbon dating, ceramic cross-dating, and the presence of pottery or other artifacts diagnostic to Nebraska phase peoples. Initial and terminal dates could be adjusted by future discoveries.

3. Research potential

Archaeological investigations should show that the mortuary facility site has the potential to contribute to better understanding of the local Late Prehistoric history, regional issues of Nebraska phase cultures and/or national trends regarding the Central Plains tradition. Research potential can be identified from the subtopics discussed in Section E. These subtopics include the categories of:

- Regional Settlement History (Population Displacement, Resettlement, and Migration);
- Making a Living: Subsistence Preferences and Practices;
- Cultural and Natural Landscapes;
- Material Culture, History and Meaning;
- Interaction, Exchange, and Conflict; and
- Development of Plains Anthropological Taxonomic Theory

4. Integrity

The requirements for integrity were derived from the documented condition of similar properties. Literature review aided in determining what conditions of preservation are required for site data to significantly contribute to our understanding of the Central Plains tradition, particularly, the Nebraska phase.

In the guidelines and criteria set forth by the Department of the Interior for the National Register of Historic Places (National Park Service 1998, 1999, 2000), integrity is a key component to any site evaluation be it archaeological or architectural in nature. Integrity is defined as "the ability of a property to convey its significance" and "to retain historic integrity a property will always possess several and usually most of the aspects" of integrity (National Park Service 1998:44). The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association.

The National Park Service (2000:35–36) specifies that, "Location, design, materials, and association are generally the most relevant aspects of integrity under Criterion D...Under Criteria C and D, integrity of setting adds to the overall integrity of an individual site and is especially important when assessing the integrity of a district. Integrity of feeling also adds to the integrity of archeological sites or districts as well as to other types of properties. Integrity of setting and feeling usually increases the 'recognizability' of the site or district and enhances one's ability to interpret an archeological site's or district's historical significance."

Therefore, for Nebraska phase mortuary facilities, integrity of location, materials, and association are of primary importance when nominating sites under Criterion D. Integrity of design, setting, workmanship, and feeling can also add to the site's integrity, although they are not critical aspects in this context. A plowed site can retain sufficient integrity if it has discernible activity areas or patterning associated with the period of significance and if it possesses good integrity of setting, materials, and association.

Property Type #3: Artifact Scatter

a. Description

Roughly sixteen percent of the Nebraska phase sites are presently categorized as Property Type #3, undefined artifact scatters with Nebraska phase materials (44 of the 275 identified sites; Table F4). The Iowa Site File lists these site types as "prehistoric scatter" or "open habitation" with Nebraska phase materials. However, the artifact scatter cannot consist of completely redeposited materials. One example

of a site that is clearly not eligible for listing on the National Register is a site where Nebraska phase materials have been disturbed by earthmoving equipment *and* the soils and associated artifacts were transported off-site to be used as fill dirt elsewhere. That site may be a Nebraska phase artifact scatters, but the artifact's place of origin is not known, and artifacts from numerous sites may be intermixed. Also clearly not eligible are isolated Nebraska phase materials found in creek beds, where their place of origin is not known. No human remains have been found at this latter example site, or the site would be categorized as Property Type #2, mortuary facilities.

The vast majority of the Property Type #3 sites have received no professional archaeological subsurface testing. Many are Paul Rowe sites or recorded in the Iowa Site File (ISF) by artifact collectors. Table F4 gives some idea about what materials have been found at these sites, and the level of work. Much of the wording in the column "Artifact summary" in Table F4 is taken directly from the ISF.

In addition to sites listed on Table F4, all of which reportedly contain Nebraska phase diagnostic artifacts, the Iowa Site File lists six other sites with "Late Woodland or Nebraska phase" ceramics: 13FM42, 13FM65, 13FM55, 13FM65, 13FM66, and 13FM70. All of these sites are at the southern 3 km range of this MPDF's geographic area. Until a definite link to the Nebraska phase can be demonstrated, these sites must be excluded from consideration under this MPDF.

Many sites of Property Type #3 have received little or no subsurface testing. A site initially presumed to be an artifact scatter may, in fact, be an earthlodge site or mortuary facility. Presumably, many artifact scatters that lack lodge or burial remnants relate to specific activities that took place at locales removed from houses or cemeteries. Such activities may include gardening, butchering, quarrying, trading, or tool making, to name a few. In the case of Nebraska phase sites in Iowa, no sites of this cultural affiliation have been linked to such specific activities, except when directly associated with lodges.

Archaeological evidence of undefined artifact scatters must contain no evidence of a lodge or burial, but must contain Nebraska phase materials, such as McVey, Beckman, Swoboda, or Debilka wares. A site that is primarily of another culture (e.g., Oneota, Great Oasis), but contains a single Nebraska phase sherd is not considered Property Type #3, or any other property type developed in this MPDF. Such sites exist, but not in the MPDF's defined geographic area (see Section G). The exact function(s) of artifact scatter sites is not presently understood.

Table F4. Nebraska Phase Artifact Scatter Sites in Iowa.

Site	Artifact summary	Type of archaeological work
13FM9	Nebraska phase pottery	Surface collection
13FM23	Flaking debris, Nebraska phase ceramics	Surface collection
13FM26	1 side-notched triangular point, fire cracked rocks, flaking debris, core, flaking tools, grit-tempered body sherds, 1 McVey Plain rim sherd	Surface collection
13FM68	Triangular notched points, collared rims, direct jar rim sherds	Surface collection
13FM108	18 sherds, many definitely Nebraska phase; 2 flaking debris; 36 fire-cracked rock; 11 burned earth; 3 burned bone; 193 charcoal	Surface collection; auger testing
13FM109	3 Nebraska phase sherds, 2 fire-cracked rocks	Auger test
13FM110	60 ceramics sherds, many definitely Nebraska phase; 2 bifaces; 1 flaking tool; 1 core; 5 utilized flakes; 7 flaking debris; 20 fire-cracked rocks; 44 daub; 25 burned earth; bone, charcoal; recent historic materials	Surface collection; auger testing
13ML23	5 notched points; scrapers, knives, Nebraska phase and Woodland pottery	Not listed on Iowa Site File form
13ML31	Flint, pottery, ashes, bone, elbow pipe	Road cut bank salvage; avocational shovel testing near roadcut; reported storage pit in the roadcut.
13ML83	2 projectile points, large side notched; Woodland and Nebraska phase pottery; celt	Surface collection; test trenches
13ML177	Central Plains pottery, 1 metate, 2 scrapers, clam shell, burned limestone	Surface collection
13ML180	8 Glenwood ceramics, bone, 3 flaking debris, introduced rocks	Backhoe test trenches, troweling sidewalls, shovel skimming
13ML184	Nearly complete Sterns Creek vessel; many other artifacts	Cut bank salvage; surface collection
13ML185	Sterns Creek sherds, Woodland and Nebraska phase artifacts	Fire pit dug in 1959
13ML186	Sterns Creek, Missouri Bluffs, and Nebraska phase artifacts; a plaster [daub]-lined pit with burned wall	Not listed on Iowa Site File form

Table F4. Continued.

Site	Artifact summary	Type of archaeological work
13ML202	Flaking debris, ceramics	8 test pits
13ML257	Woodland/Nebraska phase ceramics	Not listed on Iowa Site File form
13ML273	Nebraska phase sherds, chipping debris	Not listed on Iowa Site File form
13ML346	Bone, flaking debris, daub, introduced rock, grit tempered pottery, historics	Shovel testing
13ML348	Bone, flaking debris, introduced rock, grit tempered pottery, pipe bowl	Shovel testing
13ML356	2 Glenwood body sherds, 1 5" chert knife	Surface collection
13ML357	1 small Glenwood corner-notched point, 1 retouched flake knife, 11 flaking debris	Not listed on Iowa Site File form
13ML371	Nebraska phase ceramic, flaking debris	Not listed on Iowa Site File form
13ML380	Nebraska phase scatter	Not listed on Iowa Site File form
13ML388	Nebraska phase scatter, 1 triangular point, 2 corner notched Woodland points	Not listed on Iowa Site File form
13ML389	Nebraska phase scatter	Not listed on Iowa Site File form
13ML403	Nebraska phase scatter,1 McVey rimsherd, 2 bodysherds, 3 flakes, 1 end scraper	Area was graded for a mobile home
13ML422	Nebraska phase rim	Not listed on Iowa Site File form
13ML439	1 Beckman rim 6 flakes	Not listed on Iowa Site File form
13ML450	1 Beckman rim, 7 flakes, 2 fire-cracked rock, 1 introduced rock, 1 hammerstone	Surface collection
13ML474	Nebraska phase ceramics	Surface collection
13ML476	Nebraska phase ceramics	Surface collection
13ML481	1 McVey ware rim, 2 bodysherds, 47 flaking debris, 4 fire-cracked rock	Surface collection
13ML500	4 Nebraska phase body sherds, 1 burned bone, 2 fire-cracked rock, 1 hammerstone, 80 flaking debris, 5 flake tools	Surface collection
13ML523	1 bodysherd, 1 McVey rim, 4 flakes, 6 fire-cracked rock	Surface collection
13ML529	1 Beckman rim, 1 flake	Surface collection
13ML562	Nebraska phase and Woodland artifacts	Surface collection
13ML564	Nebraska phase artifacts	Glenwood inmates excavated here; Orr trenched 36" deep

Table F4. Continued.

Site	Artifact summary	Type of archaeological work
13ML637	Nebraska phase artifacts	Deep auger testing
13PW25	Glenwood-like rim and 6 bodysherds	Surface collection?
13PW27	1 Glenwood projectile point, chips, 1 pottery sherd, charcoal 6 bone fragments	Surface collection
13PW61	Collared ceramics, fire-cracked rock, deer and bison bone, corner notched point, knives, scrapers, cores, flaking debris, fire-cracked rock	Surface collection
13PW65	Pottery sherds, bone, charcoal, flaking debris, fire-cracked rocks	Posthole testing

b. Significance

Not all Nebraska phase activities took place at earthlodges or mortuary facilities. Hunting parties killed and butchered game, people gathered plants for their nutritive and medicinal values, and people traveled on trading forays, either to gather the materials to trade or to meet with others for the purposes of exchange. All these activities leave archaeological traces, which may be identified at artifact scatters. Up to 1,000 lodges may have been present in the Glenwood locality from A.D. 1250–1400. Between 200 and 500 Nebraska phase people may have resided in the Glenwood locality at any given time during that span (Alex 2000; Billeck 1993; Wilson 1978). Certainly, with all these people and lodges, associated activity areas should be in abundance. Yet only 44 artifact scatters have been identified, and many of these are probably earthlodges that have not been fully studied. Such an ephemeral site, with only a handful of stone tool-making flakes and some Nebraska phase pottery, may actually provide a great deal of information about these extralocal activities (Criterion D). Artifact scatters have the potential to address questions of population displacement, resettlement, and migration; subsistence preferences and farming and hunting practice; cultural and natural landscapes; materiality of economy, cultural expression, and conflict; and establishment of cultural identity.

Many artifact scatters will not, alone, answer important research questions. Such a site may still be considered a contributing element in relation to other significant sites. Nebraska phase artifact scatter sites may be designated at three progressive levels of significance: local, state, and national. If a nominated resource is significant at a national level, by default it is also significant at the local and state levels. Likewise, a site significant at the state, but not national, level is also locally significant.

Local Significance

Some sites are significant at the local level. These sites contain information that contributes to understanding of local patterns or local interests, but lack evidence that relates to broader statewide or national issues. Scientific or depositional integrity may be severely compromised, but sufficient data remain to answer

locally pertinent questions, such as cultural affiliation or site age. These sites may be considered eligible for the NRHP on a local level. Such severely compromised sites can be considered a contributing element in conjunction with a multiple property listing of other Nebraska phase sites holding state or national levels of significance.

State Significance

Artifact scatter sites significant at the state level contain features or artifacts that relate to broader statewide or regional cultural patterns, but that lack data that relate to national issues. These sites may address some of the research questions set forth in this MPDF, but lack sufficient integrity to address the majority of them. For example, sites which have moderately compromised depositional integrity may still be considered significant on this level if the potential to address a variety of statewide or regionally important research questions is present. Artifact scatters of statewide signficance may be considered a contributing element in conjunction with a multiple property listing of other Nebraska phase sites holding a national level of significance.

National Significance

It is unlikely that any artifact scatter sites have the potential to address most of the research questions set forth in this MPDF; however, if they do, those sites can be considered for nomination at a national significance level. To address most of these, the site must maintain sufficient depositional and historical integrity for activity areas to be discernible. If this integrity is present, then the potential for recovering the scientific data needed to address a wide variety of research questions of national importance will be obtainable. The absence of depositional integrity will preclude nomination at a national level of significance, although the site may be considered eligible for the NRHP at the state or local level.

c. Registration Requirements

To be considered for nomination to the National Register of Historic Places under the historic context, *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400*, an artifact scatter site must demonstrate it possesses all of the following criteria:

1. Location within the defined geographic area.
2. Nebraska phase age.
3. Research potential.
4. Integrity.

1. Location within the defined geographic area

The artifact scatter site is within the MPDF's defined geographic boundaries, very roughly defined as the Loess Hills of Fremont, Mills, and Pottawattamie counties. Detailed geographic boundaries are provided in Section G of this MPDF. Spatial boundaries of the geographic area may be adjusted by future discoveries.

2. Nebraska phase age

Archaeological investigations should demonstrate that the artifact scatter site dates to the Nebraska phase, dating between A.D. 1250–1400. This connection may be demonstrated through a variety of means, including, but not limited to, radiocarbon dating, ceramic cross-dating, and the presence of pottery or other artifacts diagnostic to Nebraska phase peoples. Initial and terminal dates could be adjusted by future discoveries.

3. Research potential

Archaeological investigations should show that the artifact scatter site has the potential to contribute to better understanding of the local Late Prehistoric history, regional issues of Nebraska phase cultures and/or national trends regarding the Central Plains tradition. Research potential can be identified from the subtopics discussed in Section E. These subtopics include the categories of:

- Regional Settlement History (Population Displacement, Resettlement, and Migration);
- Making a Living: Subsistence Preferences and Practices;
- Cultural and Natural Landscapes;
- Material Culture, History and Meaning;
- Interaction, Exchange, and Conflict; and
- Development of Plains Anthropological Taxonomic Theory

4. Integrity

The requirements for integrity were derived from the documented condition of similar properties. Literature review aided in determining what conditions of preservation are required for site data to significantly contribute to our understanding of the Central Plains tradition, particularly, the Nebraska phase.

In the guidelines and criteria set forth by the Department of the Interior for the National Register of Historic Places (National Park Service 1998, 1999, 2000), integrity is a key component to any site evaluation be it archaeological or architectural in nature. Integrity is defined as "the ability of a property to convey its significance" and "to retain historic integrity a property will always possess several and usually most of the aspects" of integrity (National Park Service 1998:44). The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association.

The National Park Service (2000:35–36) specifies that, "Location, design, materials, and association are generally the most relevant aspects of integrity under Criterion D...Under Criteria C and D, integrity of setting adds to the overall integrity of an individual site and is especially important when assessing the integrity of a district. Integrity of feeling also adds to the integrity of archeological sites or districts as well as

to other types of properties. Integrity of setting and feeling usually increases the 'recognizability' of the site or district and enhances one's ability to interpret an archeological site's or district's historical significance."

Therefore, for artifact scatters, integrity of location, materials, and association are of primary importance when nominating sites under Criterion D. Integrity of design, setting, workmanship, and feeling can also add to the site's integrity, although they are not critical aspects in this context. A plowed site can retain sufficient integrity if it has discernible activity areas or patterning associated with the period of significance and if it possesses good integrity of setting, materials, and association.

G. Geographical Data

The geographic area is defined as that portion of Loess Hills landform region which contains the 275 known Central Plains tradition archaeological sites in Iowa (Figure G1). This area includes most of the western third of present-day Mills County and portions of western Pottawattamie and Fremont counties.

The geographic area extends from the toeslope of the Missouri River valley loess bluffs eastward 2.4 to 6.5 km (1.5 to 4.0 miles) and is 88 km (55 miles) long. The geographic area covers 370 square km (143 square miles) or 37,030 hectares (91,500 acres). All of the City of Glenwood (Mills County) and portions of the cities or villages Council Bluffs, Loveland and Honey Creek (Pottawattamie); Pacific Junction and Burr Oak (Mills); and Thurman (Fremont) are located within this geographic area.

Nebraska phase ceramics have been found in other Iowa locations outside the geographic area, notably an intact ceramic vessel found near Sioux City in Plymouth County (13PM14) and identified as Nebraska phase from a photograph. Billeck (1993:15) notes the report of a collared rim sherd from a gravel bar on the East Nishnabotna River near Essex, Page County, Iowa, or 33 km (20 miles) east of any other known Nebraska phase sites. Such sites outside the defined geographic area may contain Nebraska phase items as trade goods or isolated finds, and are presently excluded from this MPDF. Spatial boundaries of the geographic area may be adjusted by future discoveries.

H. Summary of Identification and Evaluation Methods

The Multiple Property Documentation Form *Archaeological Resources of the Central Plains Tradition in the Loess Hills Region of Iowa* is the culmination of archaeological work in the region that began in the 1880s with the first descriptions of earthlodge remnants and most recently has entailed efforts to assess the integrity of previously and newly identified lodges and preserve them (Billeck 1992a, 1992d; Nagel and Riley 2007; Whittaker and Newman 2010) and worked to assess the contents and importance of artifact collections from previously excavated sites (Adair 2009; Pope 2009; Theler 2009; Tiffany 2009). Section H provides a discussion of how the historic context *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400* was developed and how property type were chosen.

Overview of Investigations

Central Plains tradition sites in Iowa are represented by Nebraska phase earthlodge sites, mortuary facilities, and artifact scatters. Earthlodges, in particular, have fascinated archaeologists since the contents of lodge depressions were first studied in the 1880s. Over the past 120 years, professionals and laypersons alike have excavated these lodges in an effort to understand the people who lived in the Glenwood locality over 600 years ago. Four overlapping stages of archaeological work have characterized Nebraska phase studies in Iowa's Loess Hills. Literature produced over these twelve decades has provided the documentation to identify and evaluate Central Plains tradition site potential for listing on the NRHP under this historic context.

Stage 1, 1880–1960s: Antiquarians, Amateurs, and Inmates

Euro-American settlers in Mills County quickly began to recognize and investigate ancient cultural features near Glenwood, and within 30 years of the earliest settlements, published descriptions of Glenwood locality earthlodges appeared (Dean 1883; Proudfit 1881a, 1881b, 1886a, 1886b). Amateur archaeologist Paul Rowe hunted the hills and ravines and excavated lodge sites around Glenwood from at least the early 1920s through the early 1960s, identifying over 200 sites (Green 1992:3). Rowe's efforts led to the accumulation of a major collection of Nebraska phase materials and several descriptions of excavations he conducted have been published (Rowe 1922, 1951, 1952a, 1952b; Davis and Rowe 1960; Billeck and Rowe 1992). In addition to his own work, Rowe more or less oversaw excavations by Francis McDowell and other inmates at perhaps 10 earthlodges on the grounds of the Glenwood State Hospital School, now known as the Glenwood Resource Center (Anderson 1954; Crismon and Green 1992). Many of the artifacts and various notes and maps from these digs became part of Rowe's collection (Anderson 1954:2). The Rowe Collection is now housed in the Mills County Historical Museum in Glenwood and in Iowa City at the Office of the State Archaeologist. Although amateur archaeology has continued in the Glenwood locality to the present, the heyday of avocational excavations was the 1930s and 1940s.

Stage 2, 1920s–1940s: First Scientific Inquiries

Through both personal visits and correspondence dating from the 1920s through the 1940s, Rowe brought to the attention of Iowa Archaeological Survey Director Charles R. Keyes the archaeological richness of the Glenwood area (e.g., Keyes 1924, Rowe 1933, 1942). As a result, Keyes arranged for his associate, Ellison Orr, to conduct an intensive survey of the Glenwood locality in 1938. With funding through the WPA, Orr hired local field assistants to identify and map 68 sites, and excavate a sample of 15 earthlodges. The materials recovered by Orr are in the Keyes Collection, presently housed at the Office of the State Archaeologist, and form a second major collection of Glenwood locality Nebraska phase materials. Orr completed a manuscript report of his survey (Orr 1942a), which was later included in a microform publication (Orr 1963) of his activities for the Iowa Archaeological Survey. A number of sites identified by Rowe, Keyes, and Orr have recently been verified and correlated, providing an important link between modern site records and the archival information provided by these early researchers (Tiffany et al.1990; Billeck 1992a).

Stage 3, 1960–present: Graduate Studies, Highway Salvage, and Synthesis

Graduate student research figured prominently in the development of Glenwood locality archaeological research in the late twentieth century. Anderson conducted excavations in the Glenwood locality in the mid 1950s as part of his graduate studies at the University of Iowa (Anderson 1961; Anderson and Anderson 1960), and again in 1969 with the onset of highway construction work on U.S. 34 west of Glenwood (Anderson 1973). Both Anderson's (1961) and Zimmerman's (1977a) graduate studies included analyses of ceramics recovered by Orr. Anderson and Zimmerman collaborated (1976) in an analysis of Glenwood locality settlement patterns that also employed Orr's site location data. Zimmerman (1977b) later expanded the Anderson-Zimmerman settlement model into a computer simulation model attempting to explain the factors that led to the known distribution of Nebraska phase components in Iowa at the time.

Billeck analyzed projectile points and ceramics recovered during the U.S. 34 excavations and conducted test excavations at 13ML360 and 13ML361 as part of his doctoral research (Billeck 1993). The density of earthlodge sites and the distinctive topographic and environmental conditions presented by the Loess Hills landform region has led to several other attempts to explain or predict Glenwood locality earthlodge location. Tiffany and Abbott (1982) used site catchment analysis to explain lodge location on the grounds of the state hospital school. Zimmerman and Artz (2006) used modern GIS data to revamp Zimmerman's earlier simulation model of site location.

The analyses and interpretations of the results emerging from the preceding investigations have been presented in many published articles, book contributions, and unpublished reports. The body of literature includes the following categories of information about the prehistory of the Glenwood locality: artifact types and seriation, subsistence and paleoenvironment, sites and settlement patterns, and spatial and temporal trends.

Stage 4, 2000–present: Preservation and Reanalysis

Reanalysis of Rowe's and Orr's notes and artifacts, and revisits to some of their recorded sites (Billeck 1991; Green 1992) made it crystal clear that many of the sites excavated fifty years previous contained some intact deposits. However, many of the recorded earthlodges and mortuary sites had been severely impacted by construction. A shift toward preserving these valuable resources has occurred. Johnson (2003) analyzed site preservation potential on the Glenwood Resource Center (GRC) property. Nagel and Riley (2007) formulated a management plan for preserving sites on that same property. Portions of the GRC were recommended for inclusion in the Iowa State Preserve system in 2007. Whittaker and Newman (2010) examined previously and newly recorded Central Plains tradition sites in an effort to assess integrity. Researchers have reexamined ceramic, litchic, botanical and faunal collections from previously excavated sites, revealing the wealth of data therein (Adair 2009; Pope 2009; Theler 2009; Tiffany 2009).

Historic Context Research

No Nebraska phase sites in Iowa have been listed on the National Register of Historic Places (NRHP). At least 23 Central Plains tradition sites or archaeological districts from other states are listed on the National Register. Six Central Plains tradition sites are National Historic Landmarks and two of those have or may have Nebraska phase components: the Leary Site and the Walker-Gilmore Site, both in the State of Nebraska (de la Vega 2003).

Pepperl (2006) formulated the historic context for Nebraska Phase sites in a six county portion of the State of Nebraska: the Multiple Property Documentation Form *Archeological Resources of the Metro Omaha Management Unit: Cass, Dodge, Douglas, Sarpy, Saunders, and Washington Counties, Nebraska*, with a single associated historic context, "Late Prehistoric Native American (Central Plains Tradition, Nebraska Phase) Settlement of the Lower Platte River Valley, Missouri Bluffs Vicinity, ca. A.D. 1000–1400." The present document builds upon Pepperl (2006), but in the Loess Hills of Iowa, on the opposite side of the Missouri River.

A general review of the published literature on Loess Hills and Nebraska phase archaeology was undertaken. Reports studied included, but were not limited to: Abbott (1980), Abbott and Miller (1978a), Adair (1988, 1990, 1992, 1993, 1994), Alex (1978, 2000), Anderson (1954, 1960b-d, 1961, 1970a-c, 1983), Anderson and Anderson (1960), Anderson (1975), Anderson and Whitworth (1977), Anderson and Tatum (1977), Asch and Green (1992, 1995), Atwell and Reed (1983), Baerreis (1969, 1970), Bailey (1995), Bales and Kvamme (2005), Bardwell (1981), Bardwell et al. (1975), Behrends (1989), Bell (1936), Benn (1972, 1986, 1990), Bettis (1990), Billeck (1985, 1987, 1991, 1992a-d, 1993), Billeck and Rowe (1992), Blakeslee (1975, 1978, 1987, 1989, 1990, 1993, 1994a-b, 2005), Blakeslee and Caldwell (1979), Boylan (1973), Bozell (1991, 1995), Bozell and Ludwickson (1994, 1999), Brown

(1967), Chidley (1998), Cordell et al. (1995), Crimson and Green (1992), Croft and Semken (1994), Davis and Rowe (1960), Dean (1883), Delavan (n.d.), DeVore (2007), Dunne (2006), Eighmy and LaBelle (1996), Fisher (1980, 1984), Fulmer (1974a-b), Gilder (1909, 1926), Gradwohl (1969), Green (1987, 1989, 1990, 1991, 1992), Green ed. (1990, 1991, 1992), Green and Asch (1995), Green and Billeck (1993), Green et al. (1992), Hedden (1993), Henning (2005), Hirst (1987, 1988b-c, 1995), Hotopp (1973a-b, 1977, 1978a-b, 1982), Hotopp and Bensend (1973), Hudson (1987), Ives (1955), C. Johnson (1998, 2007), P. Johnson (1972), Rebecca Johnson (2003), Roger Johnson (1985), Kaldahl (1993), Keyes (1924, 1949, 1951), Koch (2002), Krause (1969, 1982), Lensink (1986, 1987, 1988, 2005), Lensink and Tiffany (2005), Lillie (1990, 1992a-b), Logan and Hill (2000), Ludwickson (1979), Ludwickson and Bozell (1999), Marcucci (1990), McNerney (1987), Meyer (1977), Miller (1976a-b), Morrow (1995), Nagel and Riley (2007), Naroll (1962), Nelson (2001), Nickel (1973), O'Brien (1978a-b, 1990, 1993), Orr (1938, 1942a, 1942b), Pepperl (2006), Perry (1987a, 1991a, 1998a, 2003, 2005, 2006), Peterson (1968), Proudfit (1881a-b, 1886a-b), Pruitt (1944), Ritterbush (2007), Rogers (2006), Roper (1991, 1995, 2005, 2006, 2007), Roper and Pauls (2005), Rowe (1922, 1951, 1952a), Rowe and Davis (1960), Schermer (1982a-f, 1984, 1985, 1987a, 1993), Schermer et al. (1994, 1998), Schirmer (1996), Sellars and Ambrosino (2006), Spears (1975), Starr (1887, 1897), Steinacher and Carlson (1998), Steinauer (2006), Sterns (1915), Sullivan (2009), Theler (1990a-b), Thiessen (2001), Thompson and Bettis (1980), Thompson (1994), Tiffany (1981, 1986, 2002, 2007a-b), Tiffany and Abbott (1982), Tiffany et al. (1990), Wedel (1979, 1986), Whittaker (2005), Willey and Phillips (1959), Zimmerman (1971, 1973, 1976, 1977a-b, 1981), and Zimmerman and Artz (2006). Specific site reports, articles, field notes, correspondence, artifact catalogues, and accounts of Nebraska phase sites in Iowa were examined for this historic context. Some sites have little documentation, with all available data found on Iowa Site File (ISF) forms. The major references are compiled in Section I.

Determination of Historic Context

All examined site records appear in the Iowa Site File as "Nebraska phase," "Glenwood" culture, or "Central Plains tradition" sites, or have another reliable source of information identifying them as such. These alternate sources may include examination of a private artifact collection, or reexamination of artifacts in the OSA repository. Iowa Site File and reference review revealed several instances of multiple site numbers assigned to the same site. The same site may have been partially excavated by Rowe, Orr, and 1970s highway salvage archaeologists, with each investigator calling the site by a different name or number. The present historic context relies heavily on Billeck (1992) who unscrambled much of this confusion through fieldwork, review of notes, and consultation with local collectors. The present MPDF tries to avoid this replication of site numbers.

Information gleaned from examined sources was entered into a GIS database of Central Plains tradition sites in the Loess Hills Region. To date, 275 sites have been identified in association with the developed context, including 226 earthlodge sites (25 of which contain more than one identified lodge), 18 mortuary

facilities, and 44 artifact scatters. Thirteen of the earthlodge sites are also mortuary facilities (see sections E and F). Because several earthlodge sites contain more than one verified earthlodge, the total number of identified Nebraska phase lodges from all 226 of the earthlodge sites is 298 (Whittaker and Newman 2010; Willman 2009). This sample represents a significant increase from the approximately 240 lodges noted by earlier researchers (e.g. Alex 2000; Billeck 1993), and may provide a better understanding of the distribution of Nebraska Phase people in Iowa.

The Glenwood area is one of nine Nebraska phase localities recognized by archaeologists and the only one east of the Missouri River (Blakeslee and Caldwell 1979). *Nebraska Phase Sites in the Loess Hills Region of Iowa, A.D. 1250–1400* was targeted as a historic context because it contains the remains of studied earthlodges that have proven important in developing our understanding of both the Nebraska phase people and the Central Plains tradition as a whole.

Identification of Property Types

The property types are organized by site function. After all known Iowa sites of the Central Plains tradition were compiled into a database, an attempt was made to sort them into functional categories. Iowa Site File "site types" for these sites included bivouac, burial, camp, habitation, lodge, mound, and scatter. These are useful categories in the Iowa Site File, but not necessarily useful in determining NRHP eligibility. For purposes of this MPDF, the property type categories of dispersed earthlodge, earthlodge cluster, burials, and scatters were initially considered.

A careful review of the literature reveals that the distinction between dispersed (or isolated) and clustered lodges is often arbitrary. Therefore the decision was made to call all recorded sites with at least one verified or suspected lodge an "earthlodge site." The Iowa Site File burials category was recast into "mortuary facility" to include situations where human remains may not have been purposely interred in a burial by Nebraska phase peoples, such as human cranial or mandibular fragments that have been recovered from earthlodge floors. All known Central Plains tradition sites in the geographic area can be categorized into one of the three identified property types: earthlodge site, mortuary facility, or artifact scatter. Future research may define additional property types.

I. Major Bibliographical References

Abbott, Larry R.
1980 Burial at Council Bluffs (13PM3). In *Reports on Iowa Burial Projects: Osteology and Archaeology,* edited by Shirley J. Schermer, pp. 14–23. Research Papers 5(1). Office of the State Archaeologist, The University of Iowa, Iowa City.

Abbott, Larry R., and Dennis R. Miller
1978a *An Archaeological Survey of the Foothills Park Development, Glenwood State Hospital-School, Mills County, Iowa,* Contract Completion Report 147. Office of the State Archaeologist, The University of Iowa, Iowa City.
1978b Field notes. OSA Archives county files, Mills County. Office of the State Archaeologist, The University of Iowa, Iowa City.

Adair, Mary J.
1988 *Prehistoric Agriculture in the Central Plains.* Publications in Anthropology 16. Department of Anthropology, University of Kansas, Lawrence.
1990 *Iva Annua as a Prehistoric Cultigen in the Central Plains: A Regional Synthesis.* Paper presented at the 48th Annual Plains Anthropological Conference, Oklahoma City.
1992 Archaeobotanical Remains from the Patterson and Little Pawnee Creek Sites. In *Nebraska Phase Archaeology in the South Bend Locality,* edited by John R. Bozell and John K. Ludwickson, pp. A1-A19, Appendix A. Nebraska State Historical Society, Lincoln, Nebraska.
1993 *Premaize Gardening in the Central Plains.* Paper presented at the 58th Annual Meeting of the Society for American Archaeology, St. Louis, Missouri.
1994 Corn and Culture History in the Central Plains. In *Corn and Culture in the Prehistoric New World,* edited by Sissel Johannason and Christine A. Hasdorf, pp. 315–334. Westview Press, Boulder, Colorado.
2009 *Preliminary Report: Archaeobotanical Collections Study of Select Curated Nebraska Phase and Initial Variant Sites in Iowa.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Adair, Mary J., and William Green
2008 *Prehistoric Agriculture and the Nebraska Phase.* Paper presented at the Glenwood Symposium, Glenwood, Iowa.

Ahler, Stanley A., and Marvin Kay (editors)
2007 *Plains Village Archaeology: Bison-hunting Farmers in the Central and Northern Plains.* University of Utah Press, Salt Lake City.

Allen, Kathleen M. S.
1992 Iroquois Ceramic Production: A Case Study of Household-Level Organization. In *Ceramic Production and Distribution: An Integrated Approach,* edited by George J. Bey, III and Christopher A. Pool, pp. 133–154. Westview Press, Boulder, Colorado.

Alex, Lynn
1976 *Nebraska Culture at Glenwood.* Educational Series 5. Office of the State Archaeologist, The University of Iowa, Iowa City.
1978 *Fish Analysis 13ML155 Glenwood.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
2000 *Iowa's Archaeological Past.* University of Iowa Press, Iowa City.
2006 *Loess Hills Archaeology.* PowerPoint presentation. Electronic copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

2008 *This Old House: A.D. 1325.* PowerPoint presentation. Electronic copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Alt, Susan M.
2001 Cahokian Change and the Authority of Tradition. In *The Archaeology of Traditions, Agency and History Before and After Columbus*, edited by Timothy R. Pauketat, pp. 141–156. University Press of Florida, Gainesville.

Anderson, Adrian D.
1954 Stone Artifacts from the Glenwood Area: A Report on Dig 7, a House Site. *Journal of the Iowa Archeological Society* 4(2):2–16.
1960a *Preliminary Notes on Excavations in Southwestern Iowa.* Ms. on file, Office of the State Archaeologist, The University of Iowa City.
1960b *A Preliminary Report on 13ML12, a House-Site in the Glenwood Area.* Ms. on file, Office of the State Archaeologist, The University of Iowa City.
1960c *Report on 13ML5. The Analysis of a Surface Collection of Sherds and Stones.* Ms. on file, Office of the State Archaeologist, The University of Iowa City.
1960d *The Glenwood Sequence: A Local Sequence for a Series of Archaeological Manifestations in Mills County, Iowa.* Unpublished M.A. thesis, Department of Sociology and Anthropology, University of Iowa, Iowa City.
1961 The Glenwood Sequence: A Local Sequence for a Series of Archaeological Manifestations in Mills County, Iowa. *Journal of the Iowa Archeological Society* 10(3):1–101.
1970a *The Stille Site: Analysis and Conclusions.* Ms. on file, Office of the State Archaeologist, The Universoty of Iowa City.
1970b *Highway Salvage Archaeology, a Status Report (1966–1969).* Ms. on file, Office of the State Archaeologist, The University of Iowa City.
1970c The Stille Site: Analysis and Conclusions. *Iowa Archeological Society Newsletter* 55:6–8.
1971 Pony Creek Park. National Register of Historic Places registration form. Copy on file, State Historical Society of Iowa, Des Moines.
1973 Phase Three Highway Salvage Archaeology: 1966–1969. In *Archaeological Explorations along Iowa Highways,* by Marshall McKusick, James Boylan, and John Hotopp, pp. 20–26. Office of the State Archaeologist, The University of Iowa, Iowa City. Report submitted to the Iowa Department of Transportation, Ames.
1983 *The Impact of Structure 21 on Pony Creek Archaeology, Mills County, Iowa.* Office of the State Archaeologist, The University of Iowa, Iowa City.

Anderson, Adrian D., and Barbara Anderson
1960 Pottery Types of the Glenwood Foci. *Journal of the Iowa Archeological Society* 9(4):12–39.

Anderson, Adrian D., and Larry J. Zimmerman
1976 Settlement-Subsistence Variability in the Glenwood Locality. *Plains Anthropologist* 21:141–154.

Anderson, Duane C.
1975 The Development of Iowa Archaeology: an Overview. *Proceedings of the Iowa Academy of Science* 82:71–76.
1987 Toward a Processual Understanding of the Initial Variant of the Middle Missouri Tradition: The Case of the Mill Creek Culture of Iowa. *American Antiquity* 52:522–532.

Anderson, Duane C., and Ilene Whitworth
1977 *An Analysis of Ceramics from 13ML155: A Nebraska Phase Earthlodge from Southwestern Iowa.* Research Papers 2(10). Office of the State Archaeologist, The University of Iowa, Iowa City.

Anderson, Duane C., and Lise S. Tatum
1978 *An Analysis of the Stone Tool Assemblage from 13ML155, a Nebraska Phase Earthlodge from Southwestern Iowa.* Research Papers 3(2):1–27. Office of the State Archaeologist, The University of Iowa, Iowa City.

Anthony, David W.
1990 Migration in Archaeology: The Baby and the Bathwater. *American Anthropologist* 92:895–914.

Artz, Joe Alan, Cherie E. Haury, John G. Hedden, and Larry J. Zimmerman.
2000 *From Diaries to Data, From Data to Models: Contributions to Glenwood Locality Archaeology.* Paper presented in the symposium "Prehistory of the Lower Missouri Valley: Papers in Honor of Alfred E. Johnson," 49th Midwest/59th Plains Conference, St. Paul, Minnesota.

Asch, David L., and William Green
1992 *Crops of Ancient Iowa: Native Plant Use and Farming Systems.* Leopold Center Grant Report 90–34. Report submitted to the Leopold Center for Sustainable Agriculture, Iowa State University, Ames. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1995 Archaeobotanical Analysis. In *Phase III Excavations at 13ML118 and 13ML175, Mills County, Iowa,* by Toby A. Morrow, pp. 59–69. Contract Completion Report 469. Office of the State Archaeologist, The University of Iowa, Iowa City.

Atwell, Ricky G., and Harry F. Reed, III
1983 BRS-6026(1)—60-65 Mills County Local Roads. *Project Completion Report* 6(107). Office of the State Archaeologist, The University of Iowa, Iowa City.

Baerreis, David A.
1969 Gastropod Analysis. In *Two House Sites in the Central Plains: An Experiment in Archaeology*, edited by W. Raymond Wood, pp. 51–57. Plains Anthropologist Memoir 6. Plains Anthropological Society, Lincoln.

Baerreis, David A. (editor)
1970 Environmental Archaeology in Western Iowa. *Newsletter*, Northwest Chapter of the Iowa Archeological Society, 18(5):3–15.

Bailey, Tom
1995 *Phase I Cultural Resources Investigation of the US 34 Project from I-29 in Iowa to US 75 in Nebraska: Cass and Sarpy Counties, Nebraska, and Mills County, Iowa.* BRW, Minneapolis, Minnesota.

Bales, Jennifer R., and Kenneth L. Kvamme
2005 Geophysical Signatures of Earthlodges in the Dakotas. In *Plains Earthlodges: Ethnographic and Archaeological Perspectives,* edited by Donna C. Roper and Elizabeth P. Pauls, pp. 157–183. University of Alabama Press, Tuscaloosa.

Bardwell, Jennifer
1981 *The Paleoecological and Social Significance of the Zooarchaeological Remains from Central Plains Earthlodges of the Glenwood Locality, Mills County, Iowa.* Unpublished M.A. thesis, Department of Geology, The University of Iowa, Iowa City.

Bardwell, Jennifer, Kathleen Lakin, and Anton Till
1975 *An Archaeological Survey of Missouri River Levee Project, Pottawattamie and Mills County, Iowa.* Division of Historic Preservation, Iowa State Historical Department, Des Moines, Iowa. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Bareis, C.J., and W.M. Gardner
1968 Three Long-Nosed God masks from western Illinois. *American Antiquity* 33:495-498.

Barker, Alex W.
1988a Patterned Stylistic Behavior in the St. Helena Phase. In *St. Helena Archaeology: New Data, Fresh Interpretations*, edited by Donald J. Blakeslee, Wichita State University. J and L Reprint Company, Reprints in Anthropology No. 39, Lincoln.
1988b *Stylistic Variation and St. Helena Phase Systematics.* M.A. thesis, Department of Anthropology, Wichita State University, Kansas.

Beck, Margaret
1995 *Modeling Social Relationships through Ceramic Analysis: A Case Study from the Central Plains.* Paper presented at the 53rd Annual Plains Anthropological Conference, Laramie, Wyoming.
1998 Ceramics and Community Structure: A Reanalysis of Material from the Minneapolis Site (14OT5). *Plains Anthropologist* 43:287–310.

Behrends, Scott Alan
1989 *Paleoenvironmental Interpretation of the Late Holocene Chaboneau Local Fauna, Mills County, Southwestern Iowa.* Unpublished M.A. thesis, Department of Geology, University of Iowa, Iowa City.

Bell, E.H. (Editor)
1936 *Chapters in Nebraska Archeology*, 1(14). University of Nebraska, Lincoln.

Bell, Robert E., and Robert L. Brooks
2001 Plains Village Tradition: Southern. In *Plains*, edited by Raymond J. DeMallie, pp. 207–221. Handbook of North American *Indians*, Vol. 13, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Benn, David W.
1972 *Climate, Culture, and Prehistoric Agriculture on the North Central Plains.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1986 *The Western Iowa Rivers Basin: An Archaeological Overview.* CAR-677. Center for Archaeological Research, Southwest Missouri State University, Springfield.
1990 Depositional Stratigraphy, Site Context and Prehistoric Cultural Overview. In *Holocene Alluvial Stratigraphy and Selected Aspects of the Quaternary History of Western Iowa*, by E. Arthur Bettis, III, pp. 75–85. Iowa Quaternary Studies Group Contribution No. 36. Iowa City.

Bernbeck, Reinhard
1995 Lasting Alliances and Emerging Competition: Economic Developments in Early Mesopotamia. *Journal of Anthropological Archaeology* 14:1–25.

Bettis, E. Arthur, III
1990 Holocene Alluvial Stratigraphy of Western Iowa. In *Holocene Alluvial Stratigraphy and Selected Aspects of the Quaternary History of Western Iowa*, edited by E. Arthur Bettis, III, pp. 1–72. Midwest Friends of the Pleistocene, 37th Field Conference Guidebook. Iowa Geological Survey Bureau, Iowa City.

Bettis, E. Arthur, III, and John P. Littke
1987 Holocene Alluvial Stratigraphy and Landscape Development in Soap Creek Watershed, Appanoose, Davis, Monroe, and Wapello Counties, Iowa. Open File Report 87-2. Iowa Geological Survey Bureau, Iowa City.

Billeck, William T.

1985 C-8503A a.k.a. RS-6101(2) Mills County Local Roads. *Project Completion Report* 8(65). Office of the State Archaeologist, The University of Iowa, Iowa City.

1987 *A Reexamination of the Nebraska Phase Ceramic Sequence in the Glenwood Locality, Iowa.* Paper presented at the 45th Annual Plains Anthropological Conference, Columbia, Missouri.

1991 *Archaeological Survey of Paul Rowe Sites in Mills County, Iowa.* Paper presented at the 49th Annual Plains Anthropological Conference, Lawrence, Kansas.

1992a Archaeological Survey of Paul Rowe Sites in Mills County, Iowa. *Journal of the Iowa Archeological Society* 39:66–90.

1992b Excavations at the Millipede Site: A Nebraska Phase Earthlodge in Mills County, Iowa. *Iowa Archeological Society Newsletter* 42(1):1–2.

1992c *Points in Time: Regional Implications of a Triangular Point Sequence in the Glenwood Locality, Iowa.* Paper presented at the 50th Annual Plains Anthropological Conference, Lincoln, Nebraska.

1992d Archaeological Survey of Paul Rowe Sites in Mills County, Iowa. In *Mills County Archaeology: the Paul Rowe Collection and Southwestern Iowa Prehistory*, edited by William Green, pp. 98–143. Research Papers 17(5). Office of the State Archaeologist, The University of Iowa, Iowa City.

1993 *Time and Space in the Glenwood Locality: The Nebraska Phase in Western Iowa.* Unpublished Ph.D. dissertation, University of Missouri, Columbia.

Billeck, William T., and Paul R. Rowe.

1992 Excavation Reports by Paul Rowe: 13ML272, 13ML297, 13ML299, and 13ML396. *Journal of the Iowa Archeological Society* 39:91–98.

Blackman, E.E.

1907 Nehawka Flint Quarries. *Records of the Past* 6:103–110.

Blakeslee, Donald J.

1975 The Plains Interband Trade System: An Ethnohistoric and Archeological Investigation. Ph.D. dissertation, Department of Anthropology, University of Wisconsin.

1978 Assessing the Central Plains Tradition in Eastern Nebraska: Content and Outcome. In *The Central Plains Tradition: Internal Development and External Relationships*, edited by Donald J. Blakeslee. Report 11:134–143. Office of the State Archaeologist, The University of Iowa, Iowa City

1984 *Backs against the Wall: Estimating Archaeological Household Populations in the Central Plains.* Paper presented at the 42nd Annual Plains Anthropological Conference, Lincoln, Nebraska.

1987 *Swidden Horticulture on the Great Plains: Explaining Plains Village Settlement Patterns.* Paper presented at the 45th Annual Plains Anthropological Conference, Columbia, Missouri.

1988 An Introduction to St. Helena Archeology. In *St. Helena Archaeology: New Data, Fresh Interpretations*, edited by Donald J. Blakeslee. Reprints in Anthropology 39:1–11. J & L Reprint, Lincoln.

1989 On Estimating Household Population in Archaeological Sites, with an Example from the Nebraska Phase. In *Plains Indian Historical Demography and Health: Perspectives, Interpretations, and Critiques*, edited by Gregory R. Campbell, pp. 3–16. Plains Anthropologist Memoir 23. Plains Anthropological Society, Lincoln.

1990 A Model for the Nebraska Phase. *Central Plains Archaeology* 2:29–56.

1993 Modeling the Abandonment of the Central Plains: Radiocarbon Dates and the Origin of the Initial Coalescent. Plains Anthropologist Memoir 27:199–214. Plains Anthropological Society, Lincoln.

1994a Reassessment of Some Radiocarbon Dates from the Central Plains. *Plains Anthropologist* 39:203–210.

1994b The Archaeological Context of Human Skeletons in the Northern and Central Plains. In *Skeletal Biology in the Great Plains: Migration, Warfare, Health, and Subsistence*, edited by Doug W. Owsley and Richard L. Jantz, pp. 9–32. Smithsonian Institution Press, Washington, D.C.

2005 Middle Ceramic Period Earthlodges as the Products of Craft Traditions. In *Plains Earthlodges: Ethnographic and Archaeological Perspectives*, edited by Donna C. Roper and Elizabeth P. Pauls, pp. 83–110. University of Alabama Press, Tuscaloosa.

Blakeslee, Donald J. (editor)
1978 *The Central Plains Tradition: Internal Development & External Relationships*. Report 11. Office of the State Archaeologist, The University of Iowa, Iowa City.
1999 *Wauconda Lake: Prehistoric Swidden-foragers in the Central Plains*. Nebraska Association of Professional Archaeologists/Nebraska State Historical Society, Lincoln, Nebraska.

Blakeslee, Donald J., and Warren W. Caldwell
1979 *The Nebraska Phase: An Appraisal*. Reprints in Anthropology 18. J & L Reprint, Lincoln.

Boszhardt, Robert F.
2004 Blind Dates and Blind Faith: The Timeless Story of the "Emergent" Oneota McKern Phase. *Wisconsin Archeologist* 85:1:3–20.

Boylan, James R.
1973 *A Comparative Analysis of Lithic Industries and Subsistence Patterns in Western Iowa from 800–1550 AD*. Unpublished Ph.D. dissertation, Wayne State University, Detroit.

Bozell, John R.
1991 Fauna from the Hulme Site and Comments on Central Plains Tradition Subsistence Variability. *Plains Anthropologist* 36:229–253.
1995 Culture, Environment, and Bison Populations on the Late Prehistoric and Early Historic Central Plains. *Plains Anthropologist* 40:145–164.

Bozell, John R., and John Ludwickson
1994 *Nebraska Phase Archaeology in the South Bend Locality*. Nebraska Historical Society, Highway Archaeology Program, Lincoln, Nebraska.
1999 *Archeology of the Patterson site: Native American Life in the Lower Platte Valley, A.D. 1000–1300*. Nebraska State Historical Society, Highway Archeology Program, Lincoln, Nebraska.

Bozell, John R., John Ludwickson, Amy Koch, and Mary Adair
1999 Perspectives on the Late Prehistory of the South Bend Locality. In *Archeology of the Patterson Site: Native American Life in the Lower Platte Valley, A.D. 1000–1300*, edited by Johnr R. Bozell and John Ludwickson, pp. 101–141. Nebraska State Historical Society, Highway Archeology Program, Lincoln.

Brown, Lionel
1962–1963a Field Logs from Smithsonian Institution's River Basin Survey at the Glenwood, Iowa, Pony Creek Watershed. of notebooks on file, Mills County Folder, Archives Repository, Office of the State Archaeologist, The University of Iowa, Iowa City.
1962–1963b Smithsonian Institution's River Basin Survey site forms for the Glenwood, Iowa, Pony Creek Watershed Archaeology Survey. Copies of forms on file, Mills County Folder, Archives Repository, Officeof the State Archaeologist, The University of Iowa, Iowa City.
1966 Temporal and Spatial Order in the Central Plains. *Plains Anthropologist* 11:294–301.
1967 *Pony Creek Archeology*. Publication in Salvage Archaeology 5. River Basin Surveys. Smithsonian Institution, Lincoln, Nebraska.

Brumfiel, Elizabeth M.
2003 It's a Material World: History, Artifacts, and Anthropology. *Annual Review of Anthropology* 32:205–223.

Buhl, Dale P.
1975 A Race Against Time. *Iowa's People* 1(4):6–7.

Chang, Kwang-Chih
1958 Study of the Neolithic Social Grouping: Examples from the New World. *American Anthropologist* 60:298–334.

Chidley, Michael
1998 *Filling in a Hole: The Formation Processes and Stratigraphy of a Nebraska Phase Earthlodge.* Paper presented at the 56th Annual Plains Anthropological Conference, Bismarck, North Dakota.

Chumbley, Craig A.
1990 Mid-Nineteenth Century Vegetation of the Glenwood Locality. In *Glenwood Culture Paleoenvironment and Diet: Analysis of Plant and Animal Remains from the Wall Ridge Earthlodge (13ML176), Mills County, Iowa*, edited by William Green, pp. 8–20. Research Papers 15(6). Office of the State Archaeologist, The University of Iowa, Iowa City.

Conrad, Lawrence A.
1991 The Middle Mississippian Cultures of the Central Illinois River Valley. In *Cahokia and the Hinterlands: Middle Mississippian Cultures of the Midwest*, edited by Thomas E. Emerson and R. Barry Lewis, pp. 119–156. University of Illinois Press, Urbana, Illinois.

Cordell, John
2009 *Avian Analysis of the Lincoln 1 Site, 13ML119.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Cordell, John L., Carmen Langel, and Toby A. Morrow
1995 Analysis of Vertebrate Faunal Remains. In *Phase III Excavations at 13ML118 and 13ML175, Mills County, Iowa*, by Toby A. Morrow, pp. 52–54. Contract Completion Report 469. Office of the State Archaeologist, The University of Iowa, Iowa City.

Council Bluffs Nonpareil
1971 Skeleton Found at Glenwood in Road Digging. Section B. May 2.

Crismon, Sandra, and William Green
1992 Rediscovering Glenwood Earthlodges: The "McDowell Digs," 1938–1947. In *Mills County Archaeology: the Paul Rowe Collection and Southwestern Iowa Prehistory*, edited by William Green, pp. 20–97. Research Papers 17(5). Office of the State Archaeologist, The University of Iowa, Iowa City.

Croft, Darin A., and Holmes A. Semken, Jr.
1994 *Distribution of Mammalian Osteological Elements Recovered from Waterscreened Features, House Fill and Overburdrn of the Wall Ridge Earthlodge (13ML176), Mills County, Iowa.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Cutler, Hugh C., and Leonard W. Blake
1976 *Plants from Archaeological Sites East of the Rockies.* American Archaeology Reports No. 1. University of Missouri, Columbia.

Dallman, John E.
1983 *A Choice of Diet: Response to Climatic Change.* Report 16. Office of the State Archaeologist, The University of Iowa, Iowa City.

Davis, Donald D.
1959 Site 0-32-5. *Iowa Archeological Society Newsletter* 29:4–6.

Davis, Donald D., and Paul R. Rowe
1960 Further Notes on the Glenwood Culture: The Stille Site. *Journal of the Iowa Archeological Society* 9(3):13–17.

Dean, Seth
1883 *Antiquities of Mills County, Iowa.* Annual Report of the Smithsonian Institution, pp. 528–532. Washington, D.C.

Delavan, Fred
n.d. *Early Man Points From Mills County, Iowa, Found Locally and in the Collection of Fred Delavan, Glenwood, Iowa.* Drawings on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

de la Vega, Caridad
2003 *National Historic Landmarks—Archaeology Inventory.* Updated and revised. Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City. Available online at www.nps.gov/history/nhl/themes/Special%20Studies/NHLArcheologyInventory.pdf

DeMallie, Raymond J. (editor)
2001 *Plains.* Handbook of North American Indians, Vol. 13, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

DeVore, Steven L.
2007 *Geophysical Investigations at Site 13ML590, Mills County, Iowa.* Midwest Archaeological Center, National Park Service, Lincoln, Nebraska.

Dewar, Robert E.
1991 Incorporating Variation in Occupation Span into Settlement-Pattern Analysis. *Society for American Archaeology* 56:604–620.

Dunne, Michael T.
2006 Prehistoric Botanical Remains. In Phase II Excavations at 13ML637 and 13ML640 Primary Roads Project BRF-978-1(5)—38-65, Mills County, Iowa, by Michael J. Perry, pp. 26–37. *Project Completion Report* 29(3). Office of the State Archaeologist, The University of Iowa, Iowa City.

Eighmy, Jeffrey L., and Jason M. LaBelle
1996 Radiocarbon Dating of Twenty-Seven Plains Complexes and Phases. *Plains Anthropologist* 41:53–69.

Ember, Melvin
1973 An Archaeological Indicator of Matrilocal Versus Patrilocal Residence. *American Antiquity* 38:177–182.

Emerson, Thomas E., and R. Barry Lewis (editors)
1991 *Cahokia and the Hinterlands: Middle Mississippian Cultures of the Midwest.* University of Illinois Press, Urbana.

Eshelman, Ralph E.
1970 *Topography and Stratigraphy of the Lincoln I Site, 13ML119; Bone Artifacts of the Lincoln I Site; Faunal Analysis of the Lincoln I Site, 13ML119.* Ms. on file, Office of the State Archaeologist, The Universoty of Iowa City.

Falk, Carl R.
1969 Faunal Remains. In Two *House Sites in the Central Plains: An Experiment in Archaeology*, edited by W. Raymond Wood, pp. 44–56. Plains Anthropologist Memoir 6. Plains Anthropological Society, Lincoln.

Fay, Leslie P.
1978 *Mammals of the Garrett Farm and Pleasant Ridge Local Biotas (Holocene), Mills County, Iowa.* Unpublished M.S. thesis, Department of Geology, University of Iowa, Iowa City.

Fishel, Richard L.
1998 *Phase I Archaeological Survey of the Proposed Glenhaven Homes Project, Section 13, T72N-R43W, Mill County, Iowa.* Contract Completion Report 605. Office of the State Archaeologist, The University of Iowa, Iowa City.

Fisher, Alton K.
1978 *Reports on Human Remains from Mills, Dubuque, Des Moines, Cherokee and Webster Counties, Iowa.* Research Papers 4(3). Office of the State Archaeologist, The University of Iowa, Iowa City.
1980 Osteological Report on the Council Bluffs Burial (13PM3). In *Reports on Iowa Burial Projects: Osteology and Archaeology,* edited by Shirley J. Schermer, pp. 24–25. Research Papers 5(1). Office of the State Archaeologist, The University of Iowa, Iowa City.
1984 *Human Tooth from Site 13ML118.* Research Papers 12(1):4. Office of the State Archaeologist, The University of Iowa, Iowa City.

Fowler, Melvin L., and Robert L. Hall
1972 *Archaeological Phases at Cahokia.* Research Series Papers in Anthropology 1. Illinois State Museum, Springfield.

Frest, Terrence J., and Jeffrey R. Dickson
1986 Land Snails (Pleistocene Recent) of the Loess Hills: A Preliminary Survey. *Proceedings of the Iowa Academy of Science* 93:130–157.

Fulmer, Darrell W.
1974a *A Central Plains Earthlodge: 13ML124.* Unpublished M.A. thesis, Department of Anthropology, The University of Iowa, Iowa City.
1974b Report on Investigation of 13ML124: A Central Plains Earthlodge. In *The Impact of Structure 21 on Pony Creek Archaeology, Mills County, Iowa,* by Adrian Anderson, Appendix I. Office of the State Archaeologist, The University of Iowa, Iowa City.

Geisel, Charles A.
1999 Prehistoric Dwellings on the Great Plains: Investigating Central Plains Tradition Architectural Variation. M.A. thesis, Department of Anthropology, University of Nebraska, Lincoln.

Gilder, Robert F.
1909 Excavation of Earth-Lodge Ruins in Eastern Nebraska. *American Anthropologist* 11:56–84.
1926 *The Nebraska Culture Man.* Henry F. Keiser, Omaha.

Gilmore, G.H., and Earl H. Bell
1936 The Nehawka and Table Rock Foci of the Nebraska Aspect. In *Chapters in Nebraska Archeology*, edited by Earl H. Bell, 1(4):305–354, University of Nebraska, Lincoln.

Glenwood State Hospital School History Committee
1986 *History of Glenwood State Hospital-School.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Golden Hills Resource Conservation & Development
2006 *Glenwood American Indian Earth Lodge.* Trifold brochure. Golden Hills Resource Conservation & Development, Oakland, Iowa. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Gradwohl, David M.
1969 *Prehistoric Villages in Eastern Nebraska.* Publications in Anthropology 4. Nebraska State Historical Society, Lincoln.

Grange, Roger T., Jr.
1968 *Pawnee and Lower Loup Pottery.* Publications in Anthropology 3. Nebraska State Historical Society, Lincoln.
1979 An Archaeological View of Pawnee Origins. *Nebraska History* 60:134–160.

Greatorex, Linda J.
1997 Steed-Kisker and Nebraska Ceramics: A New Interpretation. Unpublished M.A. thesis, Department of Anthropology, University of Kansas, Lawrence.

Green, William
1987 *Archaeobotanical Analysis of 13ML176, A Glenwood Earthlodge in Southwestern Iowa.* Paper presented at the 45th Annual Plains Anthropological Conference, Columbia, Missouri.
1989 *Prehistoric Utilization of Little Barley (Hordeum pusillum) at a Nebraska Phase (Central Plains Tradition) Earthlodge.* Paper presented at the 101st Annual meeting of the Iowa Academy of Science, Storm Lake.
1990 *Central Plains Tradition Plant and Animal Use: Analysis of a Nebraska Phase Earthlodge in Western Iowa.* Paper presented at the Annual Meeting of the Society of Ethnobiology, Tempe, Arizona. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1991 The Paul Rowe Archaeological Collection: A Key to Central Plains Prehistory. *Plains Anthropologist* 36:79–86.

Green, William (editor)
1990 *Glenwood Culture Paleoenvironment and Diet: Analysis of Plant and Animal Remains from the Wall Ridge Earthlodge (13ML176), Mills County, Iowa.* Research Papers 15(6). Office of the State Archaeologist, The University of Iowa, Iowa City.
1991 The Paul Rowe Collection: A Key to Central Plains Prehistory. *Plains Anthropologist* 36:79–85.
1992 *Mills County Archaeology: The Paul Rowe Collection and Southwestern Iowa Prehistory.* Research Papers 17(5). Office of the State Archaeologist, The University of Iowa, Iowa City.

Green, William, and David L. Asch
1995 *Cultivated Plants of the Central Plains Tradition: New Data from the Glenwood Locality, Southwest Iowa.* Paper presented at the 53rd Annual Plains Anthropological Conference, Laramie, Wyoming.

Green, William, and William T. Billeck
1993 *Plant Use at the Millipede Site (13ML361), a Central Plains Earthlodge in Southwestern Iowa.* Paper presented at the 51st Annual Plains Anthropological Conference, Saskatoon, Saskatchewan.

Green, William, John C. Cordell, K. Kris Hirst, and James L. Theler
1990 Progress Report on Analysis of Avian, Reptile, Amphibian, and Pelecypod (Bivalve Mollusk) Remains from 13ML176. In *Glenwood Culture Paleoenvironment and Diet: Analysis of Plant and Animal Remains from the Wall Ridge Earthlodge (13ML176), Mills County, Iowa,* pp. 29–32. Research Papers 15(6). Office of the State Archaeologist, The University of Iowa, Iowa City.

Green, William, Cherie E. Haury, and John L. Cordell
1992 Documenting Southwestern Iowa Prehistory through the Paul Rowe Collection. *Journal of the Iowa Archeological Society* 39:1–14.

Gunnerson, James H.
1952 Some Nebraska Culture Pottery Types. *Plains Archaeological Conference News Letter* 5:34–49.
2001 Plains Village Tradition: Western Periphery. In *Plains*, edited by Raymond J. DeMallie, pp. 234–244. Handbook of North American Indians, Vol. 13, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Haas, Daniel R.
1980 *A Discussion on the Sterns Creek Complex and the Late Woodland Period in the Central Plains.* Paper presented at the 38th Plains Conference, Iowa City. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1983 *Walker-Gilmore: A Stratified Woodland Period Occupation in Eastern Nebraska.* Technical Report 8022. Division of Archaeological Research, Department of Anthropology, University of Nebraska, Lincoln.

Hall, Robert L.
1967 The Mississippian heartland and its relationship. *Plains Anthropologist* 12(36):175–183.
1991 Cahokia Identity and Interaction Models of Cahokian Mississippian. In *Cahokia and the Hinterlands*, edited by Thomas E. Emerson and R. Barry Lewis, pp. 3–34. University of Illinois Press, Urbana.

Hannus, Adrien L., and William H. Ranney, III
1989 *An Intensive Cultural Resources Survey of a Segment of Gas Interconnect Pipeline near Glenwood, in Mills County Iowa.* Augustana College, Sioux Falls, South Dakota.

Hare, Timothy S.
1990 Intrasite Spatial Analysis of a Nebraska Phase Earthlodge. Honors Research Paper, Department of Anthropology, University of Iowa. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Haury, Cherie E., John L. Cordell, and William Green
1991a *Paul R. Rowe and the Documentation of Mills County Prehistory.* Paper presented at the Glenwood Indian Earthlodge Society and the Mills County Historical Society. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1991b *The Paul Rowe Collection and the Documentation of Mills County, Iowa, Prehistory.* Paper presented at the 49th Annual Plains Anthropological Conference, Lawrence, Kansas.
1991c Paul R. Rowe and the Documentation of Mills County, Iowa, Prehistory. In *Mills County Archaeology: The Paul Rowe Collection and Southwestern Iowa Prehistory*, edited by William Green, pp. 6–19. Research Papers 17(5). Office of the State Archaeologist, The University of Iowa, Iowa City.

Hedden, John G.

1993 *The Current Central Plains Tradition Database: Assessing Advancing Information Systems within the Region.* Paper presented at the 51st Plains Anthropological Conference. Saskatoon, Saskatchewan.

1994 Riley Cord Roughened Ceramic Variation from Ten Smoky Hill Variant Sites in North-Central Kansas. *Central Plains Archaeology* 4(1): 27–42.

1997 *The Glenwood GIS Project: A New Tool for Studying the Central Plains Tradition in Western Iowa.* Paper presented a the 55th Annual Plains Anthropological Conference, Boulder, Colorado.

Henning, Dale R.

2001 Plains Village Tradition: Eastern Periphery and Oneota Tradition. In *Plains*, edited by Raymond J. DeMallie, pp. 222–233. Handbook of North American Indians, Vol. 13, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

2005 The Evolution of the Plains Village Tradition. In *North American Archaeology*, edited by Timothy R. Pauketat and Diana D. Loren, pp. 161–186. Blackwell, Boston.

2007 Continuity and Change in the Eastern Plains, A.D. 800-1700: An Examination of Exchange Patterns. In *Plains Village Archaeology, Bison-hunting Farmers in the Central and Northern Plains*, edited by Stanley A. Ahler and Marvin Kay, pp. 67–82. The University of Utah Press, Salt Lake City.

Hirst, K. Kris

1987 *Fresh Water Mussel-Shell Tools Found at Glenwood Sites, Iowa.* Paper presented at the 45th Annual Plains Anthropological Conference, Columbia, Missouri.

1988a *Late Prehistoric Freshwater Mussel Shell Use.* Paper presented at the Midwest Archaeological Conference, Urbana, Illinois.

1988b *Mussels from 13ML176.* Paper presented at the Quaternary Studies Brown Bag, Department of Geology, University of Iowa, Iowa City.

1988c *A Typology for Nebraska Phase Shell Tools.* Paper presented at the 100th Session, Iowa Academy of Science, Iowa State University, Ames.

1989 *The Usefulness of Analyses of Freshwater Clamshells at Nonmidden Sites.* Paper presented at the 47th Annual Plains Anthropological Conference, Sioux Falls, South Dakota.

1990 *Shell Games: Identifying Plant Deposits on Freshwater Mussel Shells.* Paper presented at the Office of the State Archaeologist Staff Seminar, Iowa City.

1991 *Shell Games: Freshwater Naiad Shells as Raw Material for Tools.* Paper presented at the 56th Annual Meeting of the Society for American Archaeology, New Orleans.

1995 Mussel Shell Analysis. In *Phase III Excavations at 13ML118 and 13ML175, Mills County, Iowa* by Toby A. Morrow, pp. 55–58. Contract Completion Report 469. Office of the State Archaeologist, The University of Iowa, Iowa City.

Hirst, K. Kris, and Robert G. Thompson

1990 *Shell Games: Silica Deposits on Naiad Shell Corn Shellers.* Poster paper presented at the 30th Annual Society of Ethnobiology Conference, Phoenix, Arizona.

Hirst, K. Kris, Robert G. Thompson, and Katherine S. Walters

1990 *Tracing the Use of Freshwater Naiad Shells as Prehistoric Implements through Scanning Electron Microscopy and X-ray Microanalysis.* Poster paper presented at the XII th International Congress for Electron Microscropy, Seattle, Washington.

Hirth, Kenneth
1993 The Household as an Analytical Unit: Problems in Method and Theory. In *Prehistoric Domestic Units in Western Mesoamerica*, edited by Robert S. Santley and Kenneth Hirth, pp. 21–36. CRC Press, Boca Raton, Florida.

Hoard, Robert J., John R. Bozell, Steven R. Holen, Michael D. Glascock, Hector Neff, and Michael J. Elam
1993 Source Determination of White River Group Silicates from Two Archaeological Sites in the Great Plains. *American Antiquity* 58:698–710.

Hodges, Denise C., and Shirley J. Schermer
2005 Treponematosis in the Northern and Central Great Plains: Its Nature and Distribution. In *The Myth of Syphilis, The Natural History of Treponematosis in North American*, edited by Mary Lucas Powell and Della Cook, pp. 200–226. University Press of Florida, Gainesville.

Hofman, Jack L.
1976 *The Development and Northern Relationships of Two Archeological Phases in the Southern Plains Sub-Area.* Paper presented at the Plains-Midwest Anthropological Conference, Minneapolis, Minnesota.

Hotopp, John A.
1972 *The Iowa Extension of the Central Plains Tradition.* Paper presented at the 30th Annual Plains Anthropological Conference, Lincoln, Nebraska.
1973a Phase Three Glenwood Explorations: Preliminary Report. In *Archaeological Explorations along Iowa Highways*, edited by Marshall McKusick, James Boylan, and John A. Hotopp, pp. 27–34. Office of the State Archaeologist, The University of Iowa, Iowa City. Report submitted to the Iowa State Highway Commission.
1973b Trees Used in the Construction of Glenwood Earthlodges. Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1977 *Archaeological Explorations along Iowa Highways.* Office of the State Archaeologist, The University of Iowa.
1978a *A Reconsideration of Settlement Patterns, Structures, and Temporal Placement of the Central Plains Tradition in Iowa.* Unpublished Ph.D. dissertation, The University of Iowa, Iowa City.
1978b Glenwood: A Contemporary View. In *The Central Plains Tradition: Internal Development and External Relationships*, edited by Donald J. Blakeslee, pp. 109–133. Report 11. Office of the State Archaeologist, The University of Iowa, Iowa City.
1982 Some Observations on the Central Plains Tradition in Iowa. In *Plains Indian Studies: A Collection of Essays in Honor of John C. Ewers and Waldo R. Wedel*, edited by Douglas H. Ubelaker and Herman J. Viola, pp. 173–192. Smithsonian Contributions to Anthropology 30. Smithsonian Institution, Washington, D.C.

Hotopp, John A., and D.W. Bensend
1973 *Trees Used in the Construction of Glenwood Earthlodges.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Hotopp, John A., and Margaret Hotopp
1976 Gathering the Past at Glenwood. *The Iowan* Summer:42–46.

Hudson, LuAnn
1987 *Activities Suggested by the Bone and Antler Tool Assemblages at 13ML176, a Glenwood Earthlodge.* Paper presented at the 45th Annual Plains Anthropological Conference, Columbia, Missouri.

Huscher, Harold A.
1957 *Oldham Site (39CH7) Fort Randall Reservoir, South Dakota: A Brief Summary of the Cultural Situation at the Site, based on the Latest Information.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Iowa Department of Natural Resources Geological Survey
2009 Base shapes of Iowa streams. Geographic Information Systems Support & Research Facility, Iowa State University, Ames, Iowa.

Iowa Geographic Map Server
2009 Base shapes of Iowa. Geographic Information Systems Support & Research Facility, Iowa State University, Ames, Iowa.

Iowa Geological Survey
1903 *Annual Report 1902.* Vol. XIII. Iowa Geological Survey, Des Moines, Iowa.

Ives, John C.
1955 Glenwood Ceramics. *Journal of the Iowa Archeological Society* 4(3–4):2–32.

Jensen, Richard E.
1972 Theodore Davis Site (25CC17). National Register of Historic Places registration form. On file, Nebraska State Historic Preservation Office, Lincoln.

Johnson, Alfred E.
1998 Sterns Creek Variant. In *Archaeology of Prehistoric Native America: An Encyclopedia*, edited by Guy E. Gibbon and Kenneth M. Ames, pp. 816–817. Taylor and Francis, London.

Johnson, Craig M.
1998 The Coalescent Tradition. In *Archaeology on the Great Plains*, edited by W. Raymond Wood, pp. 308–344. University Press of Kansas, Lawrence.
2007 *A Chronology of Middle Missouri Plains Village Sites.* Smithsonian Contributions to Anthropology No. 47. Smithsonian Institution Press, Washington, D.C.

Johnson, Paul C.
1972 *Mammalian Remains Associated with Nebraska Phase Earth Lodges in Mills County, Iowa.* Unpublished M.A. thesis, The University of Iowa, Iowa City.

Johnson, Rebecca Lynn
2003 *Preservation Potential of Archaeological Resources at the Glenwood Resource Center, Glenwood, Mills County, Iowa.* Contract Completion Report 1055. Office of the State Archaeologist, The University of Iowa, Iowa City, Iowa.

Johnson, Roger D.
1985 *A Modified Phase II Investigation of 13ML180, Mills County, Iowa*, Contract Completion Report 221. Office of the State Archaeologist, The University of Iowa, Iowa City.

Jones, Glynis
2005 Garden Cultivation of Staple Crops and Its Implications for Settlement Location and Continuity. *World Archaeology* 37(2):164–176.

Josephs, Richard L.
2009 Petrographic Analysis of Glenwood Locality Ceramics, Mills County, Iowa. Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Kaldahl, Eric
1993 *The Nebraska Phase: An Island of Stability in a Region of Relative Change.* Unpublished B.A. Honor's thesis, University of Nebraska, Lincoln.

Kelly, John E.
1991 Cahokia and Its Role as a Gateway Center in Interregional Exchange. In *Cahokia and the Hinterlands*, edited by Thomas E. Emerson and R. Barry Lewis, pp. 59–80. University of Illinois Press, Urbana.

Key, Patrick J.
1982 *Craniometric Relationships among Plains Indians: Culture-Historical and Evolutionary Implications.* ROI 34. Department of Anthropology, University of Tennessee, Knoxville.

Keyes, Charles R.
1924 Field notes dated June 30, 1924. Mills County File, Charles R. Keyes Collection, Office of the State Archaeologist, The University of Iowa, Iowa City.
1949 Four Iowa Archaeologies with Plains Affiliations. In *Proceedings of the Fifth Plains Conference for Archeology*, edited by John L. Champe, pp. 96–97. Laboratory of Anthropology, University of Nebraska, Lincoln.
1951 Prehistoric Indians of Iowa. *The Palimpsest* 32:281–344.

Knight, James V., Jr.
1986 The Institutional Organization of Mississippian Religion. *Society for American Archaeology* 51:675–687.

Koch, Amy
2002 *Archeology of the Beaver Creek site, Boone County, Nebraska.* Nebraska State Historical Society, Highway Archeology Program, Lincoln.

Krause, Richard A.
1969 Correlation of Phases in Central Plains Prehistory. In *Two House Sites in the Central Plains: An Experiment in Archaeology*, edited by W. Raymond Wood, 82–96. Plains Anthropologist Memoir 6. Plains Anthropological Society, Lincoln.
1970 Aspects of Adaptation among Upper Republican Subsistence Cultivators. In *Pleistocene and Recent Environments of the Central Great Plains*, edited by Wakefield Dort and J. Knox Jones, Jr., pp. 103–115. Special Publication 3. Department of Geology, University of Kansas, Lawrence.
1982 The Central Plains Tradition Revisited: A Critical Review of Recent Interpretations. *Plains Anthropologist* 27:75–82.
1989 Toward a History of Great Plain Systematics. *Plains Anthropologist* 34(126):281–289.
2001 Plains Village Tradition: Coalescent. In *Plains*, edited by Raymond J. DeMallie, pp. 196–206. Handbook of North American Indians, Vol. 13, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Kvamme, Kenneth L.
1982 A Reexamination of Roper's Trend-Surface Analysis of Central Plains Radiocarbon Dates. *Plains Anthropologist* 27:305–308.
1985 In Defense of Roper (1976). *Plains Anthropologist* 30:263–264.

Lehmer, Donald J.
1971 *Introduction to Middle Missouri Archeology.* Anthropological Papers 1. National Park Service, U. S. Department of the Interior, Washington, D.C.

Lensink, Stephen C.
1986 *Dietary Use of Decapod Crustaceans in Nebraska Culture.* Paper presented at the 44th Annual Plains Anthropological Conference, Denver.
1987 *Lithic Resources Utilization at 13ML176, a Nebraska Phase Earthlodge in the Glenwood Locality, Iowa.* Paper presented at the 45th Annual Plains Anthropological Conference, Columbia, Missouri.
1988 *Subterranean Storage in Mill Creek and Nebraska Phase Sites in Iowa.* Paper presented at the 46th Annual Plains Anthropological Conference, Wichita, Kansas.
1993 Episodic Climatic Events and Mill Creek Culture Change: An Alternative Explanation. In Prehistory and Human Ecology of the Western Prairies and Northern Plains: Papers in Honor of Robert A. Alex (1941–1988), edited by Joseph A. Tiffany, pp. 189–197. Plains Anthropologist Memoir 27. Plains Anthropological Society, Lincoln..
2005 This Old Earthlodge Village: How Long Were the Sites of the Middle Missouri Tradition Occupied? In *Plains Earthlodges: Ethnographic and Archaeological Perspectives,* edited by Donna C. Roper and Elizabeth P. Pauls, pp. 153–156. University of Alabama Press, Tuscaloosa.
2009 Preliminary Results from Radiocarbon Recalibration of Nebraska Phase Sites, with a Special Emphasis on Glenwood. Unpublished Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Lensink, Stephen C., and Joseph A. Tiffany (editors)
2005 *The Cowan Site: A Great Oasis Community in Northwest Iowa.* Report 22. Office of the State Archaeologist, The University of Iowa, Iowa City.

Lillie, Robin M.
1990 Analysis of Human Skeletal Remains from 13ML126, Mills County, Iowa. In *Reports on Iowa Burial Sites: Archaeology and Osteology,* edited by Mary C. Allen, pp. 43–44. Research Papers 15(5). Office of the State Archaeologist, The University of Iowa, Iowa City.
1992a Human Skeletal Remains from the Rowe Collection, Mills County, Iowa. In *Mills County Archaeology: the Paul Rowe Collection and Southwestern Iowa Prehistory,* edited by William Green, pp. 157–170. Research Papers 17(5). Office of the State Archaeologist, The University of Iowa, Iowa City.
1992b Human Skeletal Remains from the Rowe Collection, Mills County, Iowa. *Journal of the Iowa Archeological Society* 39:99–105.
1998a Human Skeletal Remains from 13ML203 and/or 13ML220, Mills County, Iowa. Ms. on file, OSA Burials Project 1075. Office of the State Archaeologist, The University of Iowa, Iowa City.
1998b Human Skeletal Remains from 13ML184 and/or 13ML258, Mills County, Iowa. Ms. on file, OSA Burials Project 1076. Office of the State Archaeologist, The University of Iowa, Iowa City.
2003 Human Skeletal Remains from 13ML124, Mills County, Iowa. Ms. on file, OSA Burials Project 1724. Office of the State Archaeologist, The University of Iowa, Iowa City.

Linton, Ralph
1924 The Origin of the Plains Earthlodge. *American Anthropologist* n.s., 26:247–257.

Lintz, Christopher R.
1976 *The Panhandle Aspect and its Early Relationship with the Upper Republican Phase.* Paper presented at the Plains-Midwest Anthropological Conference, Minneapolis, Minnesota.

Lippincott, Kerry A.
1976 Settlement Ecology of the Solomon River Upper Republican Sites in North Central Kansas. Ph.D. dissertation. University of Missouri, Columbia.
1978 Solomon River Upper Republican Settlement Ecology. In *The Central Plains Tradition: Internal Development and External Relationships*, edited by Donald J. Blakeslee. Report 11. Office of the State Archaeologist, The University of Iowa, Iowa City

Logan, Brad (editor)
1998 *Archaeological investigations at Kanopolis Lake, Kansas: National Register Evaluation of 14EW3, 13EW6 & 13EW19 and Shoreline Survey (1463–1465 ft amsl).* Project Report Series 100. Museum of Anthropology, University of Kansas, Lawrence.

Logan, Brad, and Matthew E. Hill, Jr.
2000 Spatial Analysis of Small Scale Debris from a Late Prehistoric Site in the Lower Missouri Valley, Kansas. *Journal of Field Archaeology* 27(3):241–256.

Ludwickson, John K.
1975 The Loup River Phase and the Origins of Pawnee Culture. Unpublished M.A. thesis, Department of Anthropology, University of Nebraska, Lincoln.
1978 Central-Plains Tradition Settlements in the Loup River Basin: The Loup River Phase. In *The Central Plains Tradition: Internal Development and External Relationships*, edited by Donald J. Blakeslee, 94–108. Office of the State Archeologist, Report No. 11, University of Iowa, Iowa City.
1979 Postulated Late Prehistoric Human Population Movements in the Central Plains: A Critical Review. *Transactions of the Nebraska Academy of Sciences* 7:53–60.

Ludwickson, John, Donald J. Blakeslee, and John M. O'Shea
1987 *Missouri National Recreational River: Native American Cultural Resources.* Publications in Anthropology 3. Wichita State University, Wichita, Kansas.

Ludwickson, John, and John R. Bozell
1994 Perspectives on the Late Prehistory of the South Bend Locality. In *Nebraska Phase Archeology in the South Bend Locality*, edited by John R. Bozell and John Ludwickson, pp. 141–163. Nebraska State Historical Society, Lincoln.
1999 Cultural and Environmental Background. In *Archeology of the Patterson Site: Native American Life in the Lower Platte Valley, A.D. 1000–1300*, edited by John R. Bozell and John Ludwickson, pp. 13–27. Nebraska State Historical Society, Lincoln.

Lueck, Edward J.
2000 *Cultural Resources Survey of Northern Natural Gas Company's Proposed NGPL Glenwood Interconnect Project in Mills County, Iowa.* Augustana College, Sioux Falls, South Dakota.

Lueck, Edward J., James D. Strait, and Peter R. Winham
1997 *A Phase I Cultural Resources Survey for Portions of Northern Natural Gas Company's Glenwood Interconnect Project - Hydrostatic Testing Segment, Mills County, Iowa.* Augustana College, Sioux Falls, South Dakota.

Marquis, Thomas B.
1978 *The Cheyennes of Montana.* Reference Publications, Algonac, Michigan.

Masters, Cathie L.
1987 *Dental Pathologies and Attrition of Some Prehistoric Eastern Great Plains Groups: Implications for Subsistence.* Unpublished M.A. thesis, Department of Anthropology, University of Nebraska, Lincoln.

Marcucci, Derrick J.
1990 *Technical Report on the Historical Documentary Research and Archaeological Investigations of the Proposed I-29 Sanitary Landfill Site, Crescent Township, Pottawattamie County, Iowa.* The Cultural Resources Group, Louis Berger and Associates, Marion, Iowa.

McKenzie, Gordon F., and Steven R. Holen
1983 *The Great Oasis Component at the Bill Packer Site, 25SM9.* Paper presented at the 93rd Annual Meeting of the Nebraska Academy of Sciences, Lincoln.

McKern, W.C.
1939 The Midwestern Taxonomic Method as an Aid to Archaeological Culture Study. *Society for American Archaeology* 4:301–313.

McNerney, Michael J.
1971 *The Effigy Complex of the Nebraska Phase and the Problem of Nebraska Phase-Mississippian Relationships.* Unpublished M.A. thesis, University of Nebraska, Lincoln.
1987 The Effigy Complex of the Nebraska Phase and the Problem of Nebraska Phase-Mississippian Relationships. *Journal of the Iowa Archeological Society* 34:23–50.

Meyer, Roy W.
1977 *The Village Indians of the Upper Missouri: The Mandans, Hidatsas, and Arikaras.* University of Nebraska Press, Lincoln.

Miller, Dennis R.
1976a *Archaeological Survey and Monitoring of a Construction Project at the State Hospital School, Glenwood, Iowa.* Research Papers 1(6). Office of the State Archaeologist, The University of Iowa, Iowa City.
1976b *A Cultural Resource Survey of the Proposed Wastewater Treatment Lagoons, Glenwood, Iowa.* Contract Completion Report 45. Office of the State Archaeologist, The University of Iowa, Iowa City.

Milner, George R., Thomas E. Emerson, Mark W. Mehrer, John A. Williams, and Duane Esarey
1984 Mississippian and Oneota Periods. In *American Bottom Archaeology*, edited by Charles J. Bareis and James W. Porter, pp. 158–186. University of Illinois Press, Urbana.

Morey, Darcy F.
1982 A Study of Subsistence and Seasonality in the Central Plains. University of Nebraska, Department of Anthropology, *Technical Report* 82–12. University of Nebraska, Lincoln.

Morrow, Toby A.
1995 *Phase III Excavations at 13ML118 and 13ML175, Mills County, Iowa.* Contract Completion Report 469. Office of the State Archaeologist, The University of Iowa, Iowa City.

Nabokov, Peter
2002 *A Forest of Time, American Indian Ways of History.* Cambridge University Press, Cambridge.

NADB-Iowa [Iowa's version of the National Archaeological Database]
2000 Document 647745: Pony Creek Park National Register of Historic Places nomination NADB-Iowa entry. Restricted access via the Iowa Site File Database at http://www2.uiowa.edu/i-sites/pro/

Nagel, Cindy L., and Melanie A. Riley
2007 *Archaeological Resource Management Plan for the Proposed Glenwood State Preserve, Mills County, Iowa.* Contract Completion Report 1553. Office of the State Archaeologist, The University of Iowa, Iowa City.

Naroll, Raoul
1962 Floor Area and Settlement Population. *American Antiquity* 27:587–589.

National Park Service
1991 *How to Apply the National Register Criteria for Evaluation.* National Register Bulletin 15, U.S. Department of the Interior, National Park Service, Washington, D.C.
1993 *Guidelines for Evaluating and Registering Historical Archaeological Sites and Districts.* National Register Bulletin 36, U.S. Department of the Interior, National Park Service, Washington, D.C.
1999 How to Complete the National Register Multiple Property Documentation Form. *National Register Bulletin 16B*, Revised. Prepared by A.J. Lee and L.F. McClelland. U.S. Department of the Interior, Interagency Resources Division, Washington, D.C.
2000 *Guidelines for Evaluation and Registering Archeological Properties.* U.S. Department of the Interior, National Park Service, Washington, D.C.
2002 *The Loess Hills of Western Iowa Special Resource Study and Environmental Assessment, January 2002.* Published by the U.S. Department of the Interior, National Park Service, Midwest Regional Office, Division of Planning and Compliance. Omaha, Nebraska.

Nebraska History
1932 Prehistoric Man in Nebraska and the Great Plains Region. *Nebraska History* 13:160–165.

Nebraska State Historical Society
2009 Nebraska National Register Sites. Available online at http://www.nebraskahistory.org/histpres/nebraska/index.htm

Nelson, Ben A., and Steven A. LeBlanc
1986 *Short-Term Sedentism in the American Southwest: The Mimbres Valley Salado.* Maxwell Museum of Anthropology and University of New Mexico Press, Albuquerque.

Nelson, Trisha
2001 *Is That a Farmer in the Dell? A GIS Analysis of the Central Plains Tradition Maize Landscape.* M.A. thesis, Department of Anthropology, University of Nebraska, Lincoln.

Netting, Robert McC., Richard R. Wilk, and Eric J. Arnould
1984 Introduction. In *Households: Comparative and Historical Studies of the Domestic Group*, edited by Robert McC. Netting, Robert R. Wilk, and Eric J. Arnould, pp. xiii-xxxviii. University of California Press, Berkeley.

Nickel, Robert K.
1973 *Botanical Remains from Sites in Mills County, Iowa.* Ms.on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Nixon, John R.
1983 *Soil Survey of Mills County, Iowa.* Soil Conservation Service, United States Department of Agriculture, Washington, D.C.

O'Brien, Patricia J.
1969 The Chronological Position of the Cambered Jar at Cahokia and Its Implications. *American Antiquity* 34:411–416.
1978a Steed-Kisker: A Western Missouri Settlement System. In *Mississippian Settlement Patterns*, edited by Bruce D. Smith, pp. 1–19. Academic Press, New York.
1978b Steed-Kisker and Mississippian Influences on the Central Plains. In *The Central Plains Tradition: Internal Development and External Relationships*, edited by Donald J. Blakeslee, pp. 67–80. Report 11. Office of the State Archaeologist, The University of Iowa, Iowa City.
1990 Evidence for the Antiquity of Gender Roles in the Central Plains Tradition. In *Powers of Observation: Alternative Views in Archaeology*, edited by Sarah M. Nelson and Alice B. Kehoe, pp. 61–72. Archeological Papers of the American Anthropological Association. American Anthropological Association, Washington, D.C.
1993 Steed-Kisker: The Western Periphery of the Mississippian Tradition. *Midcontinental Journal of Archaeology* 18:61–96.

Office of the State Archaeologist
1978a *Earthlodge People at Glenwood (Basic Version).* Iowa's P.A.S.T.: Programming Archaeology for School Teachers. Office of the State Archaeologist, The University of Iowa, Iowa City.
1978b *Iowa's P.A.S.T. (Advanced Versions) 1) Archaeology & You; 2) The Early Iowans; 3) Earthlodge People; 4) NW Iowa Farmers; 5) Iowa's Historic Indians: The Mesquakie.* Iowa's P.A.S.T.: Programming Archaeology for School Teachers. Office of the State Archaeologist, The University of Iowa, Iowa City.
1984 Glenwood Earthlodge Excavation Photographs. No site number listed. On file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Omaha World Herald
1971 Cemetery in Highway Path: Bulldozer Bares Mystery Graves. Evening Edition, May 16.

Orr, Ellison
1938 Mills County Fieldnotes, vol. 1–3, A-H. Copy of file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1942a *Report of an Archaeological Survey of Mills County, Iowa, Sponsored by the Iowa State Planning Board, WPA Project 3600, April 12 to Dec. 5, 1938.* Iowa Archaeological Reports, Vol. 10. Electronic copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1942b Sundry Archaeological Papers and Memoranda, Vol. 12. Ms. on file, Effigy Mounds National Monument, McGregor, Iowa. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1963 Iowa Archaeological Reports 1934–1939 with an Evaluation and Index by Marshall McKusick, edited by David Baerreis. *Archives of Archaeology, Society for American Archaeology*, Microcard Series 20. University of Wisconsin Press, Madison.

Pawnee Tribal Council
1990 *Petition of the Pawnee Tribe of Oklahoma for Repatriation of Human Remains and Associated Burial Goods from the Nebraska Historical Society.* Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Pauketat, Timothy R.
2001 Practice and History in Archaeology: An Emerging Paradigm. *Anthropological Theory* 1(1):73–98.
2003 Resettled Farmers and the Making of a Mississippian Polity. *American Antiquity* 68(1):39–66.
2005 The Forgotten History of the Mississippians. In *North American Archaeology*, edited by Timothy R. Pauketat and Diana D. Loren, pp. 187–211. Blackwell, Boston.

Pauketat, Timothy R., and Susan M. Alt
2003 Mounds, Memory, and Contested Mississippian History. In *Archaeologies of Memory*, edited by Ruth M. Van Dyke and Susan E. Alcock, pp. 151–179, Blackwell, Boston.

Pepperl, Robert E.
2006 *Archaeological Resources of the Metro Omaha Management Unit Cass, Dodge, Douglas, Sarpy, Saunders, and Washington Counties, Nebraska.* National Register of Historic Places Multiple Property Documentation form. Nebraska State Historic Preservation Office, Nebraska State Historical Society, Lincoln, Nebraska. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Perry, Michael J.
1983 RS-6026(4), Mills County Local Roads. *Project Completion Report* 7(113). Office of the State Archaeologist, The University of Iowa, Iowa City.
1984 Letter of March 16, 1984 to David L. Cook, Historic Preservation Specialist, Office of Project Planning, Iowa Department of Transportation, Ames. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1987a Phase II Test Excavation at Sites 13ML118, 13ML122,and 13ML175, Local Roads Project RS-6026(6), Mills County, Iowa. *Project Completion Report* 10(122). Office of the State Archaeologist, The University of Iowa, Iowa City.
1987b *Recent Investigations in the Glenwood Locality, Iowa.* Paper presented at the 45th Annual Plains Anthropological Conference, Columbia, Missouri.
1987c *Archaeological Musings* [on Glenwood earthlodges and ceramics]. Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1987d Notes from Mills County Historical Society Museum exhibit [no longer on display]. Office of the State Archaeologist, The University of Iowa, Iowa City.
1990 A Phase I Archaeological Survey of Local Systems Project LC-9091–4 and LC-9293–3 Mills County, Iowa. *Project Completion Report* 13(113). Office of the State Archaeologist, The University of Iowa, Iowa City.
1991a *An Archaeological Survey of the Lower Pony Creek Valley: Implications for Glenwood Locality Settlement Pattern.* Paper presented at the 49th Plains Anthropological Conference, Lawrence, Kansas.
1991b *Following the Footprints of Rowe, Keyes, and Orr: An Archaeological Survey of the Lower Pony Creek Valley.* Paper presented at the Annual Meeting of the Iowa Archeological Society, Ames, Iowa. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.
1998a An Archaeological Survey of the Lower Pony Creek Valley: Implications for Glenwood Locality Settlement Pattern. *Central Plains Archaeology* 6(1):1–34.
1998b Field notes, archaeological survey of the Lower Pony Creek valley. On file, Office of the State Archaeologist, The University of Iowa, Iowa City.
2001 *A Pony Creek Settlement Model.* Paper presented at the 59th Annual Plains Anthropological Conference, Lincoln, Nebraska.
2003 A Pony Creek Settlement Model. *Journal of the Iowa Archeological Society* 50:129–138.
2005 Phase I Archaeological Survey of Primary Roads Project BRF-978–1(5)—38–65, Mills County, Iowa. *Project Completion Report* 28(9). Office of the State Archaeologist, The University of Iowa, Iowa City.
2006 Phase II Excavations at 13ML637 and 13ML640 Primary Roads Project BRF-978–1(5)—38–65, Mills County, Iowa. *Project Completion Report* 29(3). Office of the State Archaeologist, The University of Iowa, Iowa City.

2008 *An Initial Geoarchaeological Survey of Lower Keg Creek Valley, Mills County, Iowa.* PowerPoint presentation, Quaternary Brown Bag, Geoscience Department, University of Iowa. Electronic copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Peterson, Cynthia L., and William E. Whittaker
2010 Draft *West Oak Forest Earthlodges Site [Site 13ML652].* National Register of Historic Places Registration Form. On file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Peterson, Drexel A., Jr.
1968 *Mississippian Influences in the Plains.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Pollock, Susan, Melody Pope, and Cheryl Coursey
1996 Household Production at the Uruk Mound, Abu Salabikh, Iraq. *American Journal of Archaeology* 100:683–698.

Pope, Melody K.
2009 *Loess Hills Chipped Stone Collection Assessment – Preliminary Results of a Pilot Study.* Ms.on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Pope, Melody, and Susan Pollock
1995 Trade, Tools, and Tasks: A Study of Uruk Chipped Stone Industries. In *Research in Economic Anthropology Volume 16*, edited by Barry L. Isaac, pp. 227–266. JAI Press, Greenwich, Connecticut.

Potter, Elizabeth Walton, and Beth M. Boland
1992 *Guidelines for Evaluating and Registering Cemeteries and Burial Places.* National Register Bulletin 41. U.S. Department of the Interior, National Park Service, Washington, D.C.

Prior, Jean C.
1991 *Landforms of Iowa.* University of Iowa Press, Iowa City.

Proudfit, S.V.
1881a Earthworks on the Missouri River. *American Antiquarian* 3:139.
1881b Antiquities of the Missouri Bluffs. *American Antiquarian* 3:271–280.
1886a The Lodge Dweller. *American Antiquarian* 8:222–228.
1886b Pottery Vessels at Glenwood, Iowa. *American Antiquarian* 8:229.

Pruitt, O.J.
1944 Indian Burials of Pottawattamie County. *Annals of Iowa* 25:246–253.

Reynolds, John D.
1979 *The Grasshopper Falls Phase of the Plains Woodland.* Anthropological Series 7. Kansas State Historical Society, Topeka.

Rhodes, R. Sanders, III
1984 *Paleoecology and Regional Paleoclimatic Implications of the Farmdalian Craigmile and Woodfordian Waubonsie Mammalian Local Faunas, Southwestern Iowa.* Reports of Investigations No. 40. Illinois State Museum, Springfield.

Rhodes, R. Sanders, III, and Holmes A. Semken, Jr.
1976 *Paleontological Investigations within the Waubonsie Creek Watershed, Iowa.* NTIS PB-260 767. Department of Geology, University of Iowa, Iowa City. Submitted to National Park Service, Denver. Copy on file, Department of Geology, The University of Iowa, Iowa City.
1986 Quaternary Biostratigraphy and Paleoecology of Fossil Mammals from the Loess Hills Region of Western Iowa. *Proceedings of the Iowa Academy of Science* 93:94–130.

Richardson, Erin L.
1998 *Taphonomic Study of Bone and Shell Preservation in the Loess Hills of the Missouri River Valley: Case Study of a Nebraska Earthlodge.* Paper presented at the 56th Annual Plains Anthropological Conference, Bismarck, North Dakota.

Ritterbush, Lauren W.
2007 Oneota Interaction and Impact in the Central Plains. In *Plains Village Archaeology: Bison-hunting Farmers in the Central and Northern Plains*, edited by Stanley Ahler and Marvin. Kay, pp. 181–192. University of Utah Press, Salt Lake City.

Rogers, Leah D.
2006 *Glenwood Indian Earthlodge Project: TAN Consultation in Support of REAP/HRDP Grant No. 05–018, Mills County, Iowa.* Tallgrass Historians L.C., Iowa City, Iowa.

Roper, Donna C.
1976 A Trend-Surface Analysis of Central Plains Radiocarbon Dates. *American Antiquity* 41:181–189.
1985 Some Comments on Kvamme's Reexamination of Roper's Trend-Surface Analysis. *Plains Anthropologist* 30:259–261.
1991 *Ethnological Conceptions of the Role of the Horse and the Development of Central Plains Archaeology.* Paper presented at the 56th Annual Meeting of the Society for American Archaeology, New Orleans, Louisiana.
1995 Spatial Dynamics and Historical Process in the Central Plains Tradition. *Plains Anthropologist* 40:203–221.
1998 The Schudel Site Complex. *Central Plains Archeology* 6(1):1–34.
2005 Earthlodge Dynamics 101: Construction and Deterioration Issues and Their Lessons for Archaeologists. In *Plains Earthlodges: Ethnographic and Archaeological Perspectives*, edited by Donna C. Roper and Elizabeth P. Pauls, pp. 111–132. University of Alabama Press, Tuscaloosa.
2006 The Central Plains Tradition. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 105–132. University Press of Kansas, Lawrence.
2007 Origins and Expansion of the Central Plains Tradition. In *Plains Village Archaeology: Bison-hunting Farmers in the Central and Northern Plains*, edited by Stanley A. Ahler and Marvin Kay, pp. 53–63. The University of Utah Press, Salt Lake City.

Roper, Donna C. (editor)
1989 *Protohistoric Pawnee Hunting in the Nebraska Sand Hills: Archaeological Investigations at Two Sites in the Calamus Reservoir.* Commonwealth Cultural Resources Group, Jackson, Michigan.

Roper, Donna C., and Elizabeth P. Pauls
2005 What, Were, and When is an Earthlodge? In *Plains Earthlodges: Ethnographic and Archaeological Perspectives,* edited by Donna C. Roper and Elizabeth P. Pauls, pp. 1–31. University of Alabama Press, Tuscaloosa.

Roper, Donna C., and Elizabeth P. Pauls (editors)
2005 *Plains Earthlodges: Ethnographic and Archaeological Perspectives*. University of Alabama Press, Tuscaloosa.

Rowe, Paul R.
1922 Decorative Markings on some Fragments of Pottery from Mills County, Iowa. *Proceedings of the Iowa Academy of Science* 29:53–59.
1933 Letter of June 27, 1933, to Charles R. Keyes, Director, Iowa Archaeological Survey, State Historical Society of Iowa, Iowa City. Microfilm copy on file, Office of State Archaeologist, The University of Iowa, Iowa City.
1942 Letter of July 19, 1942, to Charles R. Keyes, Director, Iowa Archaeological Survey, State Historical Society of Iowa, Iowa City. Microfilm copy on file, Office of State Archaeologist, The University of Iowa, Iowa City.
1951 Notes on Early Man and Archaic Sites in the Glenwood Area. *Iowa Archeology Society Newsletter* 3&4:4–6.
1952a Early Horizons of Mills County, Iowa, Part I, Evidences of Early Man. *Journal of the Iowa Archeological Society* 1(3):6–13.
1952b Early Horizons of Mills County, Iowa, Part II, Pre-Pottery Sites. *Journal of the Iowa Archeological Society* 2(1):3–10.

Rowe, Paul R., and Donald D. Davis
1960 Further Notes on the Glenwood Culture: The Stille Site. *Journal of the Iowa Archeological Society* 9(3):13–17.

Rowe, Paul S.
1928 Tornado as it Passed Glenwood. *Proceedings of the Iowa Academy of Sciences* 35:239–240.

Sassaman, Kenneth E.
1998 Crafting Cultural Identity in Hunter-Gatherer Economies. In *Craft and Social Identity*, edited by Cathy Lynne Costin and Rita Wright, pp. 93–107. Archeological Papers of the American Anthropological Association 8, Washington, D.C.

Satorius-Fox, Marsha R.
1982 *Paleoecological Analysis of Micromammals from the Schmidt Site, a Central Plains Tradition Village in Howard County*. Unpublished M.A. thesis, The University of Iowa, Iowa City.

Scarry, Margaret C., and John F. Scarry
2005 Native American 'Garden Agriculture' in Southeastern North America. *World Archaeology* 37(2):259–274.

Schermer, Shirley J.
1982a *Human remains from Site 13ML126*. Research Papers 7(2):320–321. Office of the State Archaeologist, The University of Iowa, Iowa City.
1982b *Human remains from Site 13ML130*. Research Papers 7(2):322–323. Office of the State Archaeologist, The University of Iowa, Iowa City.
1982c *Human remains from Site 13ML138*. Research Papers 7(2):324–325. Office of the State Archaeologist, The University of Iowa, Iowa City.
1982d *Human remains from Site 13ML139*. Research Papers 7(2):326–327. Office of the State Archaeologist, The University of Iowa, Iowa City.
1982e *Human remains from Site 13ML140*. Research Papers 7(2):328–329. Office of the State Archaeologist, The University of Iowa, Iowa City.

1982f *Human remains from Site 13ML155.* Research Papers 7(2):330–331. Office of the State Archaeologist, The University of Iowa, Iowa City.

1984 1984 Glenwood Excavation. *Iowa Archeological Society Newsletter* 112:4–5.

1985 *Excavation of a Glenwood Earthlodge: 1984 IAS Field School.* Paper presented at the Annual Meeting of the Iowa Archeological Society, Cherokee, Iowa. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

1987a *Excavating a Glenwood Earthlodge: An Overview.* Paper presented at the 45th Annual Plains Anthropological Conference, Columbia, Missouri.

1987b *Introduction to Midwestern Prehistory (Emphasis Iowa).* Guided Correspondence Study Guide for 113:20 correspondence course. The University of Iowa, Iowa City.

1993 *Analysis of Human Remains from the Council Bluffs Ossuary, 13PW1, Pottawattamie County, Iowa.* Research Papers 18(1):195–220. Office of the State Archaeologist, The University of Iowa, Iowa City.

Schermer, Shirley J., Alton K. Fisher, and Denise C. Hodges

1994 Endemic Treponematosis in Prehistoric Western Iowa. In *Skeletal Biology in the Great Plains: Migration, Warfare, Health, and Subsistence,* edited by Douglas W. Owsley and Richard L. Jantz, pp. 109–121. Smithsonian Institution Press, Washington, D.C.

Schermer, Shirley J., William Green, and Joseph A. Tiffany

1992 The Household Economy of a Prehistoric Horticultural Homestead from the Glenwood Culture of the Great Plains. National Science Foundation grant proposal. On file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Schermer, Shirley J., Linda Forman, Robin M. Lillie, Jill Robinson, and Larry Zimmerman

1998 NAGPRA Inventory Project: Charles R. Keyes Collection 13PW43, Fairmont Park Mound. In *NAGPRA Inventory and Consultation: Human Remains and Funerary Objects in the Charles R. Keyes Collection.* Research Report 23(1):299–300.

Schirmer, Ronald C.

1996 *Analysis of Wood Charcoal from the Millipede Site (13ML361).* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Scott, Donna H.

1972 *Analysis of Avifauna from Five States in Northwestern Iowa.* Unpublished M.A. thesis, University of Wisconsin, Madison.

Scott, F.W.

1995 Tradeware in the Central Plains Tradition: Steed-Kisker Presence, Influence, and Joining of the Central Plains Tradition. *Kansas Anthropologist* 16(1):46–68.

Sellars, Jonathan R., and Leslie A. Ambrosino

2006 *Archaeological Investigations at Site 13ML590, City of Glenwood, Mills County, Iowa.* Report CAS-654. Consulting Archaeological Services, Creston, Iowa.

Semken, Holmes A., Jr., and Carl R. Falk

1987 Late Pleistocene/Holocene Mammalian Faunas and Environmental Changes on the Northern Plains of the United States. In *Late Quaternary Mammalian Biogeography and Environments of the Great Plains and Prairies,* edited by Russell W. Graham, Holmes A. Semken, Jr., and Mary Ann Graham, pp. 176–313. Scientific Papers Vol. 22. Illinois State Museum, Springfield.

Shaw, Robert D.
1974 *The Houston Site (25btl), a Nebraska Phase Site from Burt County, Nebraska.* Unpublished M.A. thesis, Washington State University, Pullman.

Spears, Don G.
1975 Glenwood Excavation 13ML155. *Iowa Archeological Society Newsletter* 77:14.

Starr, Frederick
1887 Mounds and Lodge Circles in Iowa. *American Antiquarian* 9:361–363.
1897 Summary of the Archaeology of Iowa. *Proceedings of the Davenport Academy of Natural Sciences* 6:53–124.

Stein, Gil
1998 Diasporas, Colonies and World Systems: Rethinking the Archaeology of Inter-Regional Interaction. Distinguished Lecture, Archaeology Division, 97th Annual Meeting of the American Anthropological Association, December 2-6, Philadelphia.

Steinacher, Terry L.
1976 *The Smoky Hill Phase and Its Role in the Central Plains Tradition.* Unpublished M.A. Thesis, Department of Anthropology, University of Nebraska, Lincoln.

Steinacher, Terry L., and Gayle F. Carlson
1984 *Nebraska Highway Archeological and Historical Salvage Investigations 1969–1975.* Publications in Anthropology 10. Nebraska State Historical Society, Lincoln.
1998 The Central Plains Tradition. In *Archaeology on the Great Plains*, edited by W. Raymond Wood, pp. 235–268. University Press of Kansas, Lawrence.

Steinacher, Terry L., John Ludwickson, G.F. Carlson, and John R. Bozell
1991 *An Evaluation of Central Plains Tradition-Pawnee Ancestry.* Paper presented at the 49th Annual Plains Conference, Lawrence, Kansas.

Steinauer, Karen A.
2006 *Patterson Site (25SY31).* National Register of Historic Places registration form. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City

Sterns, Frederick H.
1915 *The Archaeology of Eastern Nebraska, with Special Reference to the Culture of Rectangular Earth Lodges.* Unpublished Ph.D. dissertation, Harvard University, Cambridge.

Strong, William D.
1935 An Introduction to Nebraska Archaeology. *Smithsonian Institution, Miscellaneous Collections* 93(10):1–323. Washington, D.C.

Sullivan, Justin
2009 *Archaeological Site Predictive Modeling: Six Southwest Iowa Counties.* Paper presented at the Iowa State University GIS Seminar, Ames, Iowa

Tandarich, John P., and Loren N. Horton
1976 A Memorial Bibliography of Charles R. Keyes and Ellison J. Orr. *Journal of the Iowa Archeological Society* 23:45–143.

Theler, James L.
1990a Prehistoric Freshwater Mussel (Naiad) Assemblages from Southwestern Iowa. *American Malacological Bulletin* 7:127–130.
1990b Progress Report on the Analysis of Fish and Gastropod Remains from the Wall Ridge Site (13ML176). In *Glenwood Culture Paleoenvironment and Diet: Analysis of Plant and Animal Remains from the Wall Ridge Earthlodge (13ML176), Mills County, Iowa.* Research Papers 15(6):21–28. Office of the State Archaeologist, The University of Iowa, Iowa City.
2009 *Loess Hills Nebraska Phase Archaeological Sites: Faunal Remains to Assess Human Subsistence, Local and Regional Environments, and the Biogeography of Represented Animal Species.* Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Thiessen, Thomas D.
2001 *A Summary of the Archeology of the Loess Hills Landform Region in Western Iowa.* National Park Service, Midwest Archeological Center, Lincoln, Nebraska.

Thompson, Dean M., and E. Arthur Bettis, III
1980 Archeology and Holocene Landscape Evolution in the Missouri Drainage of Iowa. *Journal of the Iowa Archeological Society* 27:1–60.

Thompson, Robert G.
1994 *The Analysis of Opal Phytoliths Recovered from Food Residues from Selected Sherds from the Paul Rowe Collection, Glenwood, Iowa (draft).* Woodward-Clyde Consultants, Minneapolis, Minnesota. Copy on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Tiffany, Joseph A.
1977 Artifacts from the Sharps' Site: A Sterns Creek Component in Southwestern Iowa. *Journal of the Iowa Archeological Society.* 24:85–124.
1981 A Compendium of Radiocarbon Dates from Iowa Archaeological Sites. *Plains Anthropologist* 26 (91): 55–73.
1986 An Archaeological Research Design for the Western Iowa Loess Hills. *The Proceedings of the Iowa Academy of Sciences* 93(3):158–162.
1991a Models of Mississippian Culture History in the Western Prairie Peninsula: A Perspective from Iowa. In *Cahokia and the Hinterlands*, edited by Thomas E. Emerson and R. Barry Lewis, pp. 183–192. University of Illinois Press, Urbana.
1991b Modeling Mill Creek-Mississippian Interaction. In *New Perspectives on Cahokia, Views from the Periphery*, edited by James B. Stoltman, pp. 319–347. Monographs in World Archaeology No. 2, Prehistory Press, Madison, Wisconsin.
1998 Southeast Iowa Oneota: A Review. *The Wisconsin Archeologist* 79:147–164.
2002 Archaeological Perspectives on Southwest Iowa. *Journal of the Iowa Archeological Society* 49:11–26.
2003 Mississippian connections with Mill Creek and Cambria. *Plains Anthropologist* 48(184):21-34.
2007a Examining the Origins of the Middle Missouri Tradition. In *Plains Village Archaeology: Bison-hunting Farmers in the Central and Northern Plains*, edited by Stanley A. Ahler and Marvin Kay, pp. 3–14. University of Utah Press, Salt Lake City.
2007b *The Swanson Site Reexamined: The Middle Missouri Tradition in Central South Dakota.* Special Publication of the South Dakota Archaeological Society 12.
2009 Ceramic Analysis of Three Glenwood Culture Sites, Mills County, Iowa. Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Tiffany, Joseph A. (compiler)
1981 *The Keyes Archaeological Collection: A Finder's Guide.* Iowa State Historical Department, Division of the State Historical Society, Iowa City.

Tiffany, Joseph A., and Larry R. Abbott
1982 Site Catchment Theory: Applications to Iowa Archaeology. *Journal of Field Archaeology* 9(3):313–322.

Tiffany, Joseph A., Shirley J. Schermer, and Debby Z. Baker
1990 Documenting Archaeological Sites in the Charles R. Keyes Collection. *Journal of the Iowa Archeological Society* 37:88–92.

Timberlake, Robert D.
1991 Ceramics. In *The Avoca Site (14JN332): Excavation of a Grasshopper Falls Phase Structure, Jackson County, Kansas*, by Timothy G. Baugh, pp. 57–64. Contract Archaeology Publication 8, Kansas State Historical Society, Topeka.

Toom, Dennis L.
1992 Radiocarbon Dating of the Western Initial Middle Missouri Variant: Some New Dates and a Critical Review of Old Dates. *Plains Anthropologist* 37:115–128.

van der Veen, Marijke
2005 Gardens and Fields: The Intensity and Scale of Food Production. *World Archaeology* 37(2):157–163.

Varien, Mark D.
1999 *Sedentism and Mobility in a Social Landscape: Mesa Verde and Beyond.* University of Arizona Press, Tucson.

Weakly, Ward F.
1961 *Tree-Rings and Archeology in the Central Plains.* Unpublished M.A. thesis, University of Nebraska, Lincoln.

Wearin, Otha D.
1977 *Paul Raymond Rowe: Tracker of Ancient Indians.* Malvern Leader Publishing, Malvern, Iowa.

Wedel, Waldo R.
1935 *An Introduction to Pawnee Archaeology.* Bulletin 112. Bureau of American Ethnology Bulletin, Smithsonian Institution, Washington, D.C.
1940 Culture Sequence in the Central Great Plains. *Smithsonian Miscellaneous Collections* 100:291–352.
1956 Changing Settlement Patterns in the Great Plains. In *Prehistoric Settlement Patterns in the New World,* edited by Gordon R. Willey, pp. 81–92. Viking Fund Publications in Anthropology 23. Wenner-Gren Foundation for Anthropological Research, New York.
1959 *An Introduction to Kansas Archaeology.* Bulletin 114. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.
1961 *Prehistoric Man on the Great Plains.* University of Oklahoma Press, Norman.
1970 *Some Observations on "Two House Sites in the Central Plains: An Experiment in Archaeology."* Nebraska History, Lincoln .
1978 The Prehistoric Plains. In *Ancient Native Americans*, edited by Jesse D. Jennings, pp. 183–219. W. H. Freeman, San Francisco.
1979 House Floors and Native Settlement Populations in the Central Plains. *Plains Anthropologist* 24:85–98.

1986 *Central Plains Prehistory*. University of Nebraska Press, Lincoln.
2001 Plains Village Tradition: Central. In *Plains*, edited by Raymond J. DeMallie, pp. 173–185. Handbook of North American Indians, Vol. 13, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Wedel, Waldo R., and Richard A. Krause
2001 History of Archeological Research. In *Plains*, edited by Raymond J. DeMallie, pp. 14–22. Handbook of North American Indians, Vol. 13, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Whittaker, William E.
2005 *Ground-Penetrating Radar Survey of Late Prehistoric Site 13ML637, Section 23, T72N-R43W, Mills County, Iowa*. Contract Completion Report 1268. Office of the State Archaeologist, The University of Iowa, Iowa City.
2008a Notes on Field Survey with Howard Ettleman, 13FM24, 13FM22, 13FM26, 13FM105, 13ML648, one folder. Office of the State Archaeologist, The University of Iowa, Iowa City.
2008b Notes on Field Survey with Sam Collins, 13ML288, 13ML647, 13PW24, 13PW205, 13PW206, 13PW207, one folder. Office of the State Archaeologist, The University of Iowa, Iowa City.

Whittaker, William E., and Adam Newman
2010 Recent Archaeological Investigations of the Loess Hills. In *Cultural Resources of the Loess Hills: A Focus Study to Determine National Significance of Selected Archaeological and Architectural Cultural Resources along the Loess Hills National Scenic Byway*, pp. 2.1–2.176, edited by Melody K. Pope and Angela R. Collins. Contract Completion Report 1700. Office of the State Archaeologist, The University of Iowa, Iowa City.

Wilk, Richard R., and Wendy Ashmore
1988 *Household and Community in the Mesoamerican Past*. University of New Mexico Press, Albuquerque.

Wilk, Richard R., and William L. Rathje
1982 Household Archaeology. *American Behavioral Scientist* 25(6):617–639.

Willey, Gordon R., and Phillip Phillips
1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago.

Williams, Stephen, and John M. Goggin
1956 The Long Nosed God Mask in the Eastern United States. *The Missouri Archaeologist* 18(3):3–72.

Willman, John
2009 Recorded Earthlodges in the Iowa Site File and Degrees of Site Disturbances. Ms. on file, Office of the State Archaeologist, The University of Iowa, Iowa City.

Wilson, Gilbert L.
1978 *The Hidatsa Earthlodge*. Anthropological Papers of the American Museum of Natural History 33, Pt.V, 1934. Reprints in Anthropology 11. J & L Reprints, Lincoln, Nebraska.

Winham, R. Peter
1997 *A Phase I Cultural Resources Survey for Portions of Northern Natural Gas Company's Glenwood Branchline Abandonment and New 4-inch Line Project in Mills County, Iowa*. Augustana College, Sioux Falls, South Dakota.
1998 *Cultural Resources Monitoring of the Topsoiling of a Work Area near Keg Creek for a Northern Natural Gas Company's Glenwood Interconnect Project – Mills County, Iowa*. Augustana College, Sioux Falls, South Dakota.

Wood, W. Raymond
1962 A Stylistic and Historical Analysis of Shoulder Patterns on Plains Indian Pottery. *American Antiquity* 28:25–40.
1969 Ethnographic Reconstructions. In *Two House Sites on the Central Plains: An Experiment in Archaeology,* edited by Raymond W. Wood, pp. 102–108. Plains Anthropologist Memoir 6. Plains Anthropological Society, Lincoln.
2001 Plains Village Tradition: Middle Missouri. In *Plains*, edited by Raymond J. DeMallie, pp. 186–195. Handbook of North American *Indians*, Vol. 13, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Wood, W. Raymond (editor)
1998 *Archaeology on the Great Plains.* University Press of Kansas, Lawrence, Kansas.

Zimmerman, Larry J.
1971 *The Glenwood Taxonomic Problem.* Unpublished M.A. thesis, The University of Iowa, Iowa City.
1973 *Prehistoric Locational Behavior: Computer Simulation of Central Plains Tradition Settlement in the Glenwood Locality, Mills County, Iowa.* Unpublished Ph.D. dissertation, The University of Iowa, Iowa City.
1976 Archaeological Research in the Glenwood Locality: Changing Perspectives. *Proceedings of the Iowa Academy of Science* 83:121–124.
1977a The Glenwood Local Sequence: A Re-examination. *Journal of the Iowa Archeological Society* 24:62–83.
1977b *Prehistoric Locational Behavior: A Computer Simulation.* Report 10. Office of the State Archaeologist, The University of Iowa, Iowa City.
1981 Review of Blakeslee and Caldwell: The Nebraska Phase: An Appraisal. *Plains Anthropologist* 26:258.
1990 *Ancient History of the Pawnee Nation.* Vermillion, South Dakota.
2005 Maria Pearson's Role in World Archaeology. In Still Running: A Tribute to Maria Pearson, Yankton Sioux, edited by David M. Gradwohl, Joe B. Thompson, and Michael J. Perry, pp. 61–66. Special Commemorative Issue. *Journal of the Iowa Archeological Society* 52(1).

Zimmerman, Larry J., and Joe A. Artz
2006 Scale, Model Complexity, and Understanding: Simulation of Settlement Processes in the Glenwood Locality of Southwestern Iowa, 1976 and 2000. In *Confronting Scale in Archaeology: Issues of Theory and Practice,* edited by Gary Lock and Brian Leigh Molyneaux, pp. 129–144. Springer Science and Business Media, New York.

Index of Figures

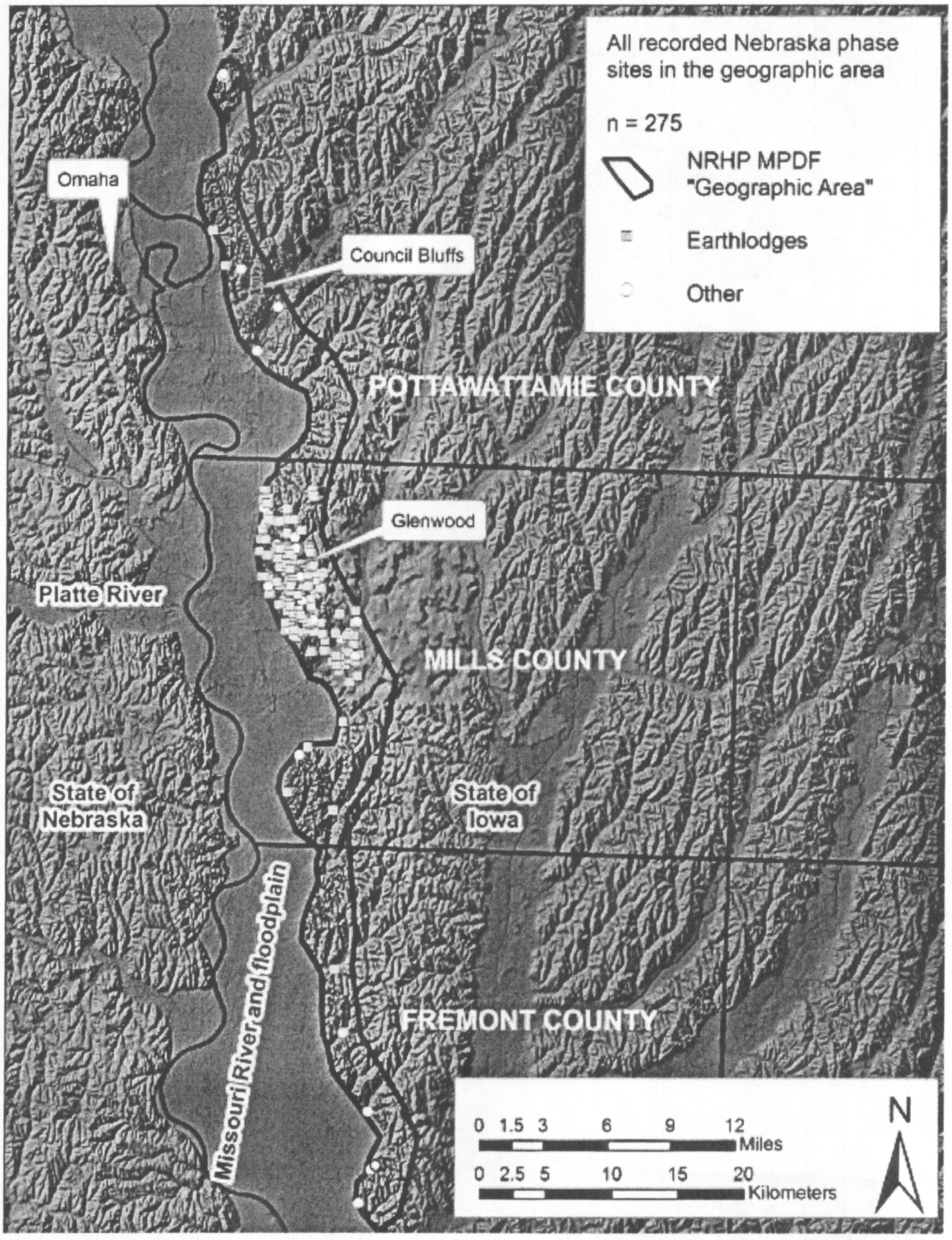

Figure E1. Topographic relief map depicting the locations of Nebraska phase sites in the geographic area (base map from Iowa Geographic Map Server 2009).

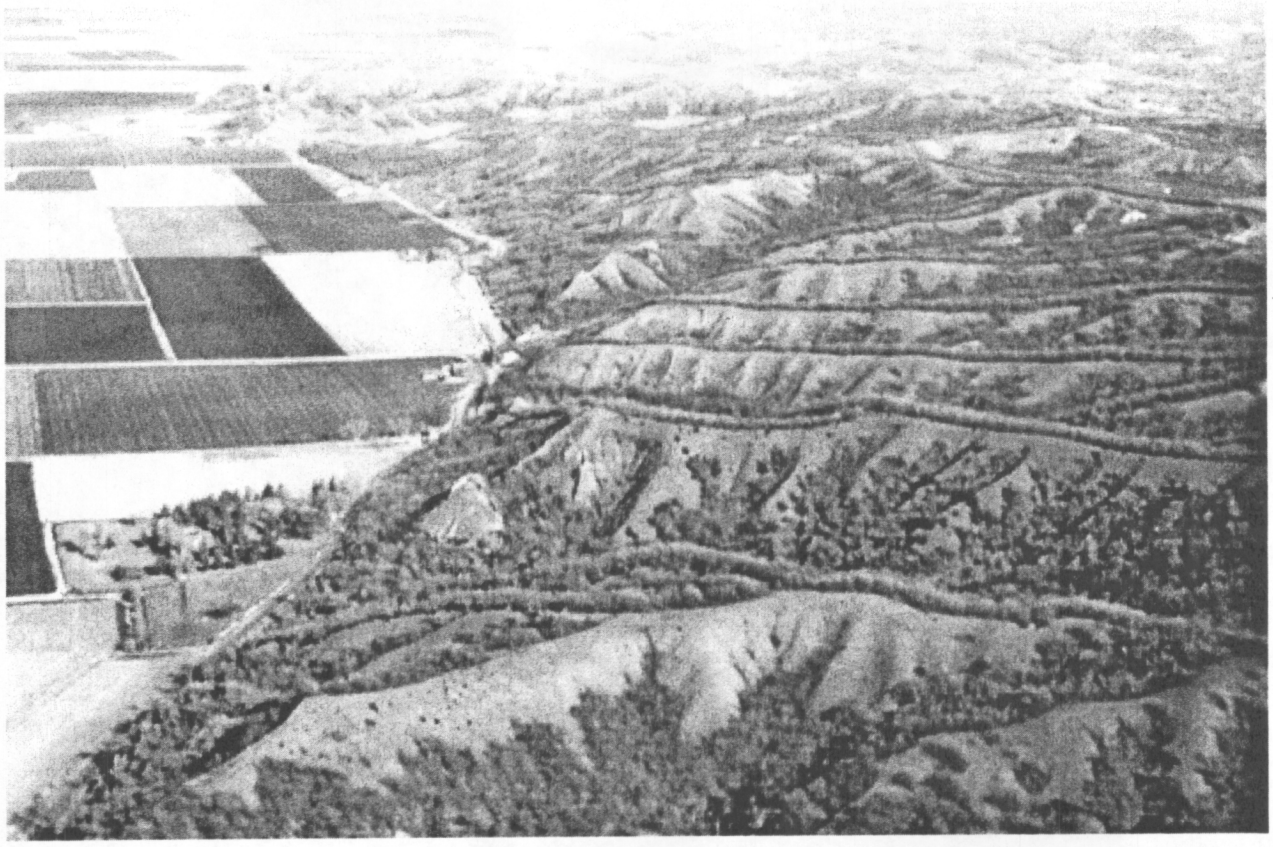

Figure E2. Aerial view of the Loess Hills of western Iowa (from Office of the State Archaeologist 1978a:G3).

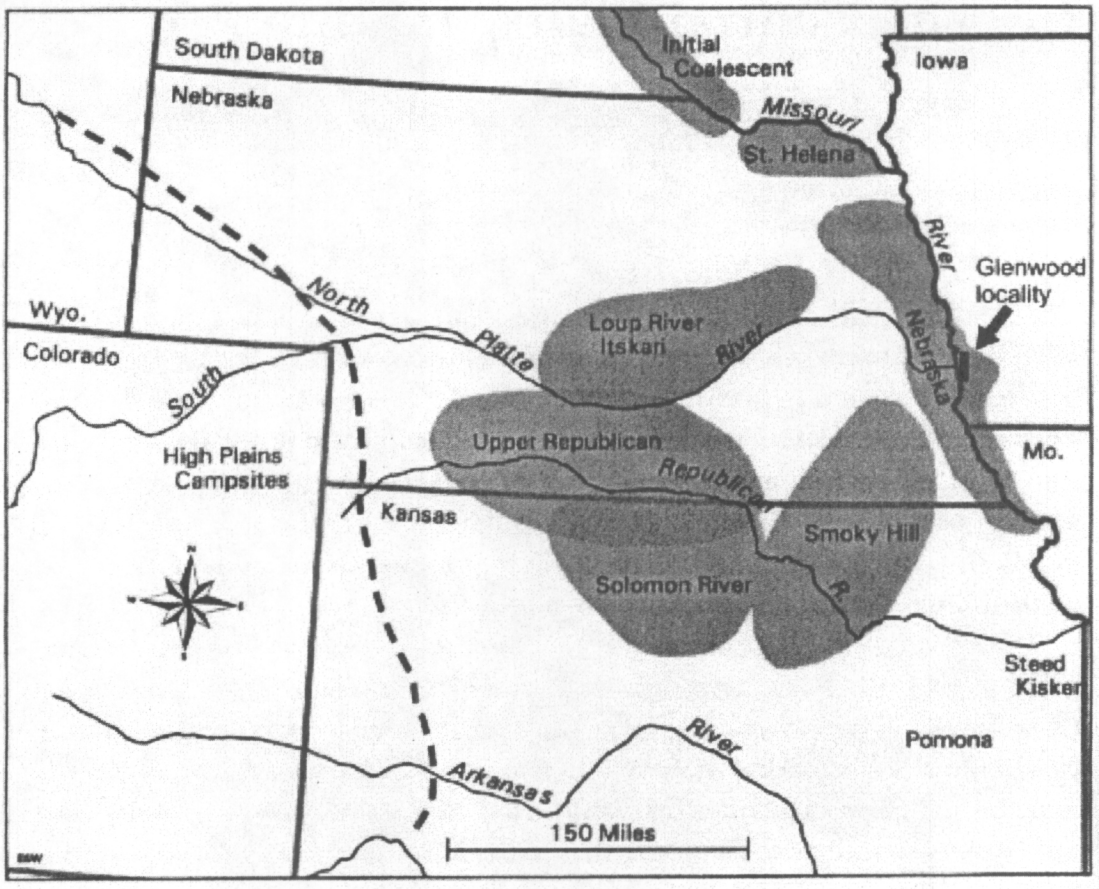

Figure E3. Principal taxonomic units of the Central Plains tradition (modified from Steinacher and Carlson 1998:236).

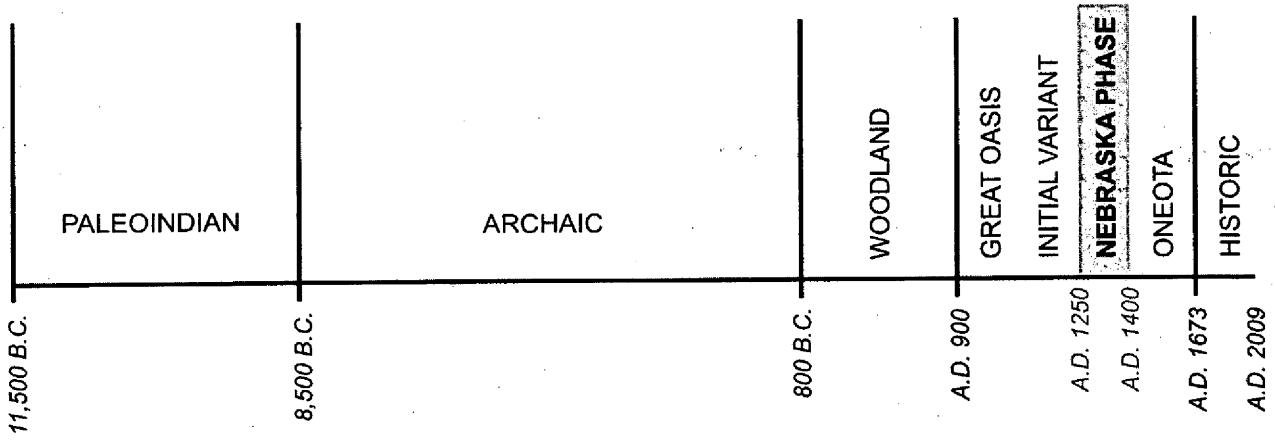

Figure E4. Prehistoric timeline of western Iowa (compiled from Alex 2000; Lensink 2009; Tiffany 2009).

Figure E5. Artist's reconstruction of Nebraska phase lodge (from Alex 2000:177; illustration by Mary M. Slattery).

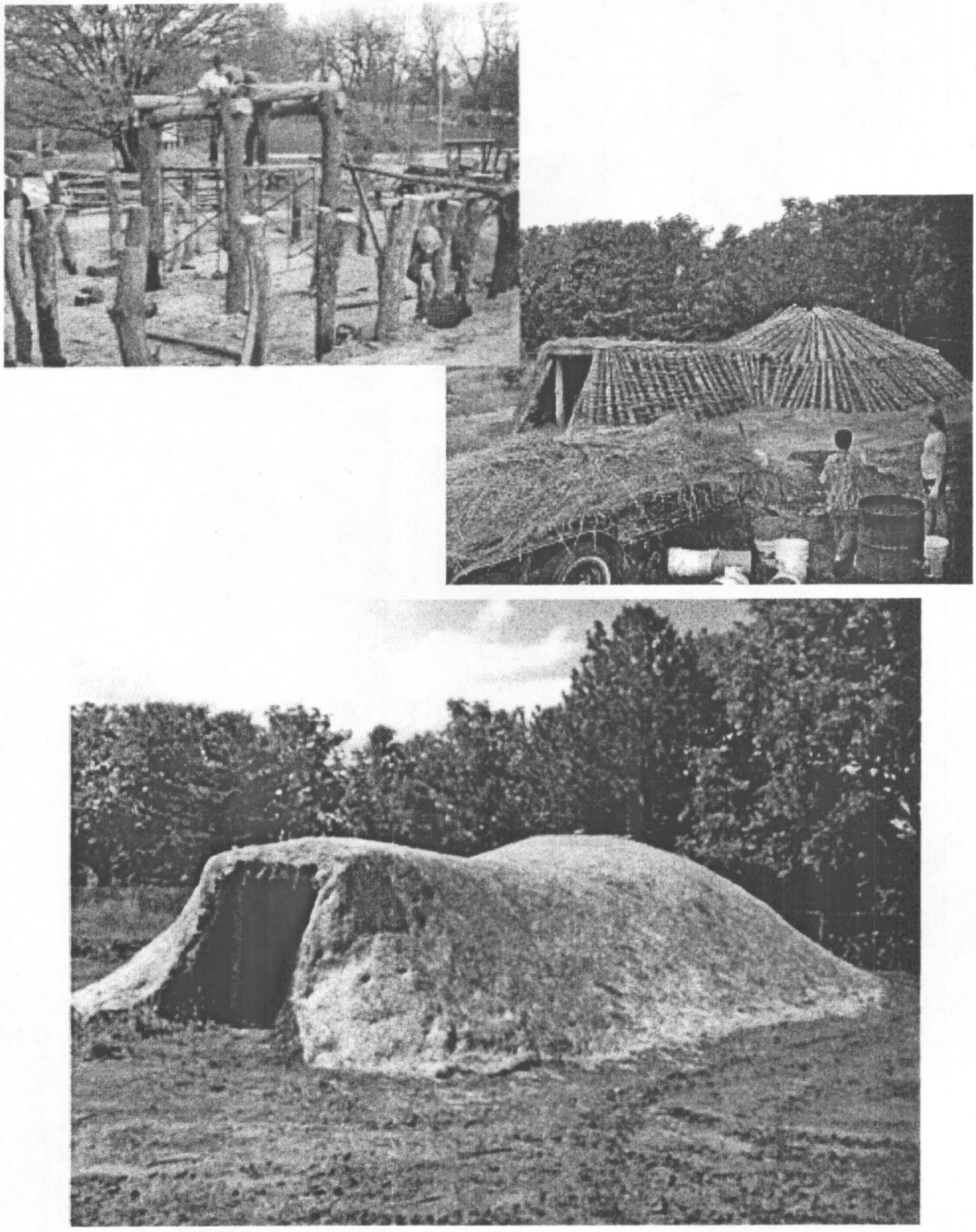

Figure E6. Modern reconstruction of an earthlodge in Glenwood, Iowa. Upper: laying the timber framework; center: completed framework, before mud and grass is added. Lower: completed earthlodge (adapted from Golden Hills Resource Conservation & Development 2006).

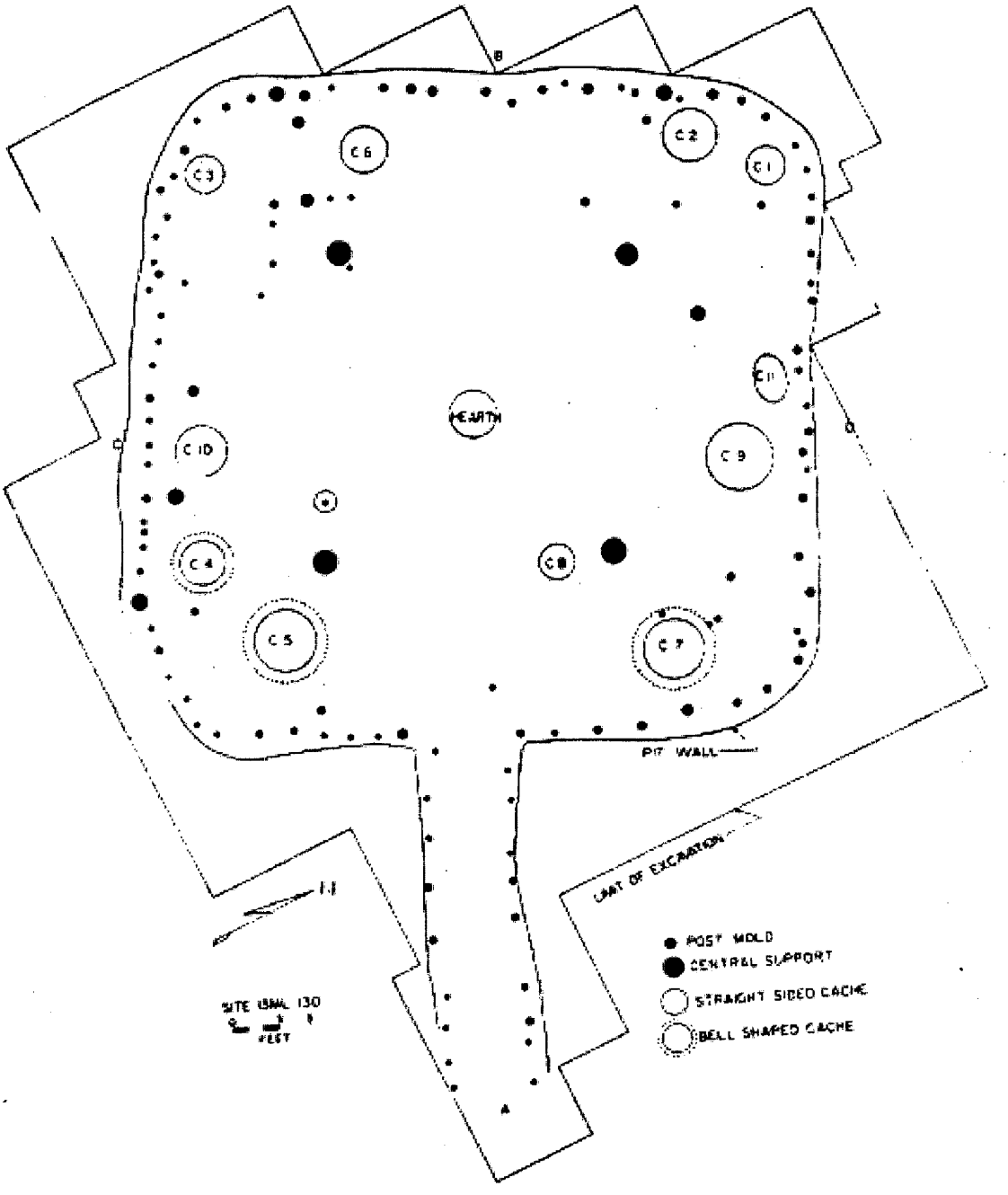

Figure E7. Floor plan of excavated site 13ML130, a typical Nebraska phase earthlodge, showing post mold exterior outlines, four large interior support posts, central hearth, and numerous interior storage pits (from Hotopp 1978a:149).

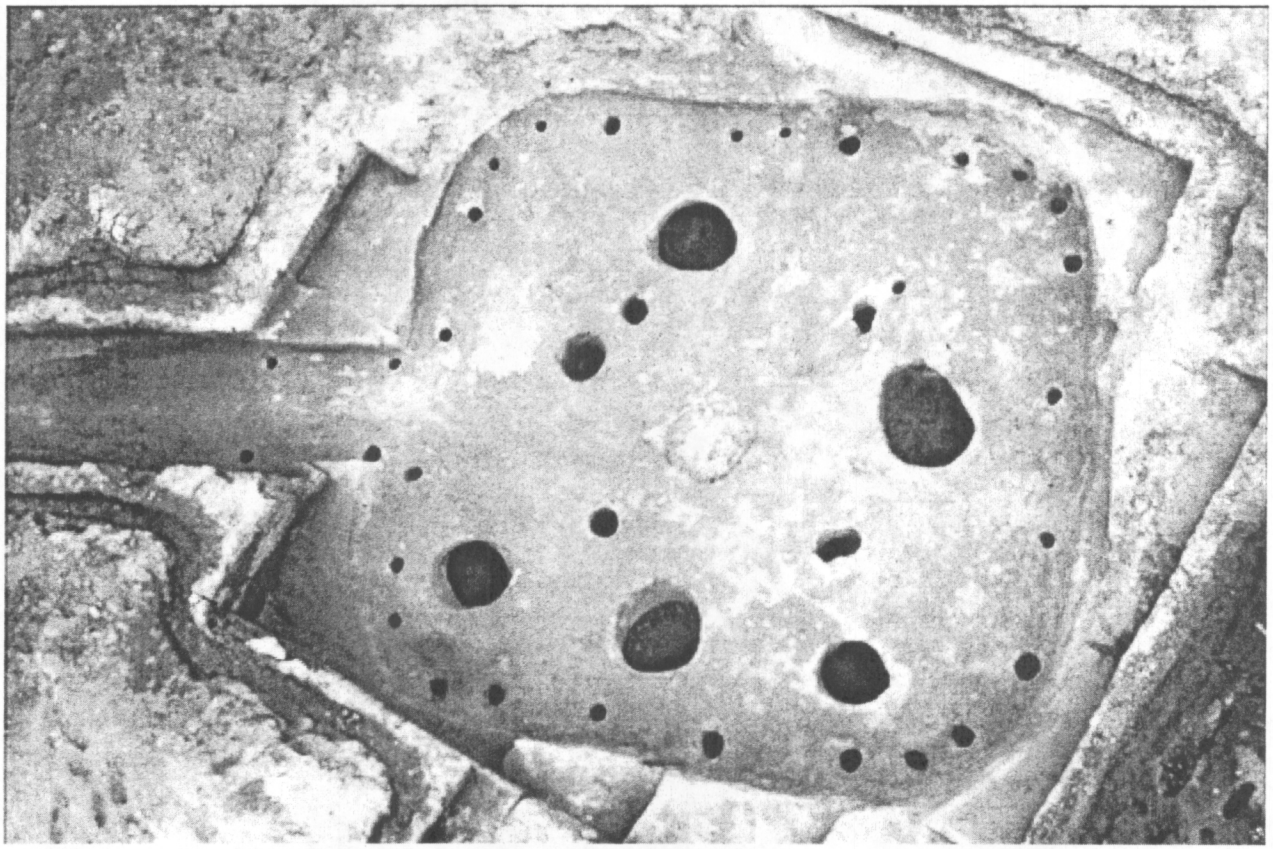

Figure E8. Excavated Nebraska phase earthlodge at site 13ML139 in the Glenwood locality. Photograph showcases the locations of the excavated post molds defining the lodge's exterior; four larger, center support post molds surrounding the central hearth; large storage pits; and elongated entryway (from Office of the State Archaeologist 1978a:G12).

Figure E9. The 1984 excavation of a large storage pit within an earthlodge at site 13ML176, the Wall Ridge Site, in the Glenwood locality (from Office of the State Archaeologist 1984).

Figure E10. Photograph of typical Nebraska phase earthlodge depression near Glenwood, Iowa, as was in evidence in 1938 (from Orr 1942:9). This is site 13ML5. Original caption reads: Photograph of Surface Basin of House Site X-18—the W. Lohse Site on [redacted] Looking South. Sept. 26, 1938.

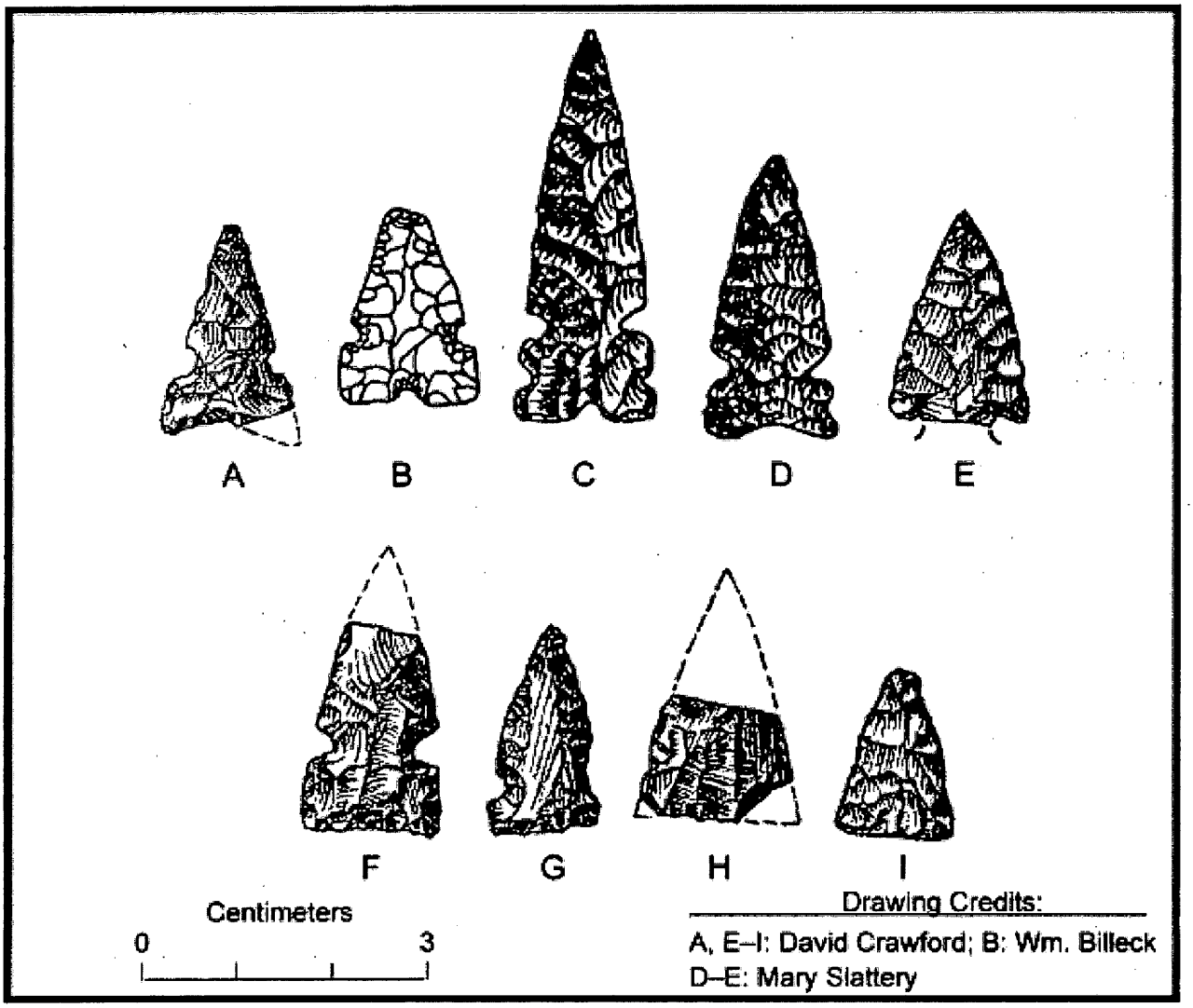

Figure E11. Projectile points from Nebraska phase sites in the Glenwood locality. A, 13ML118; B, 13ML122; C–D, 13ML155; E–I: 13ML175 (adapted from Anderson and Tatum 1978; Perry 1987a; and Morrow 1995).

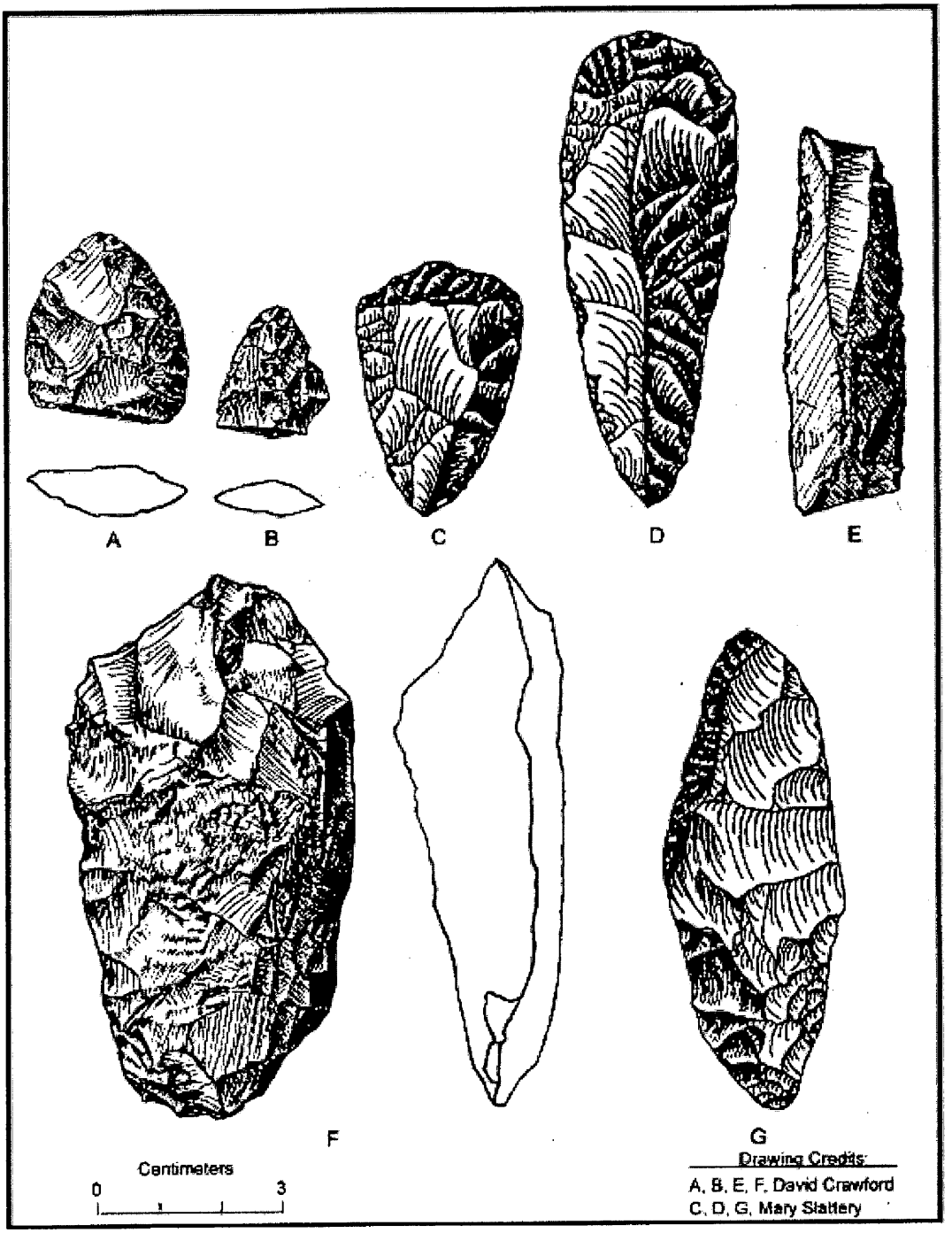

Figure E12. Chipped stone tools from Nebraska phase sites in the Glenwood locality. A, B, F: Bifaces, 13ML118; C, D: scrapers, 13ML155; E: retouched blade, 13ML175; G: double bevel knife, 13ML155 (adapted from Anderson and Tatum 1978 and Morrow 1995).

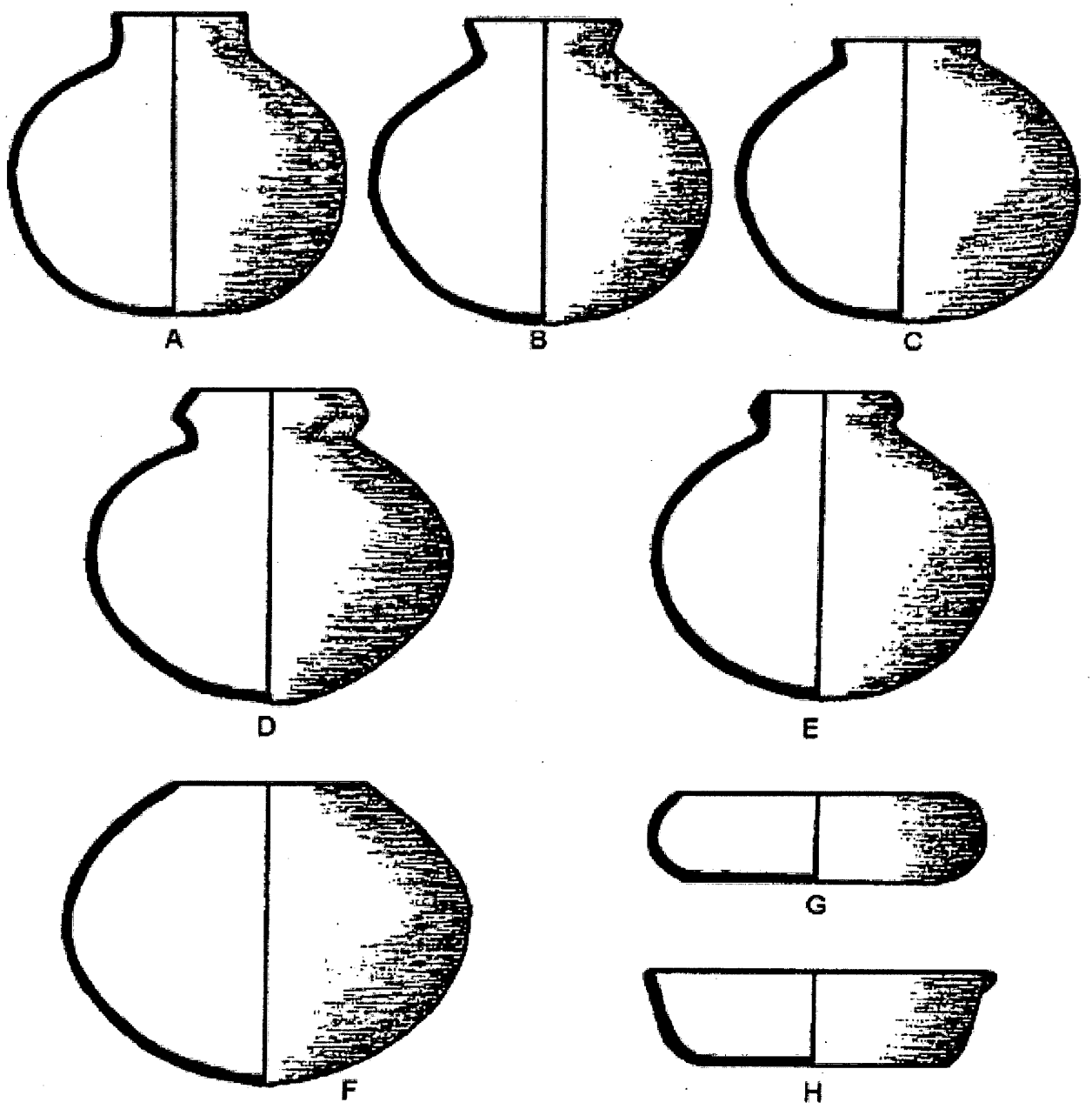

Figure E13. Nebraska phase ceramic vessel types. A-C: McVey ware (direct rim jars); D: Swoboda ware (collared rim jars); E: Beckman ware (collared rim jars); F: Debilka ware (seed jars); G–H: Debilka ware (bowls) (adapted from Anderson 1961:85).

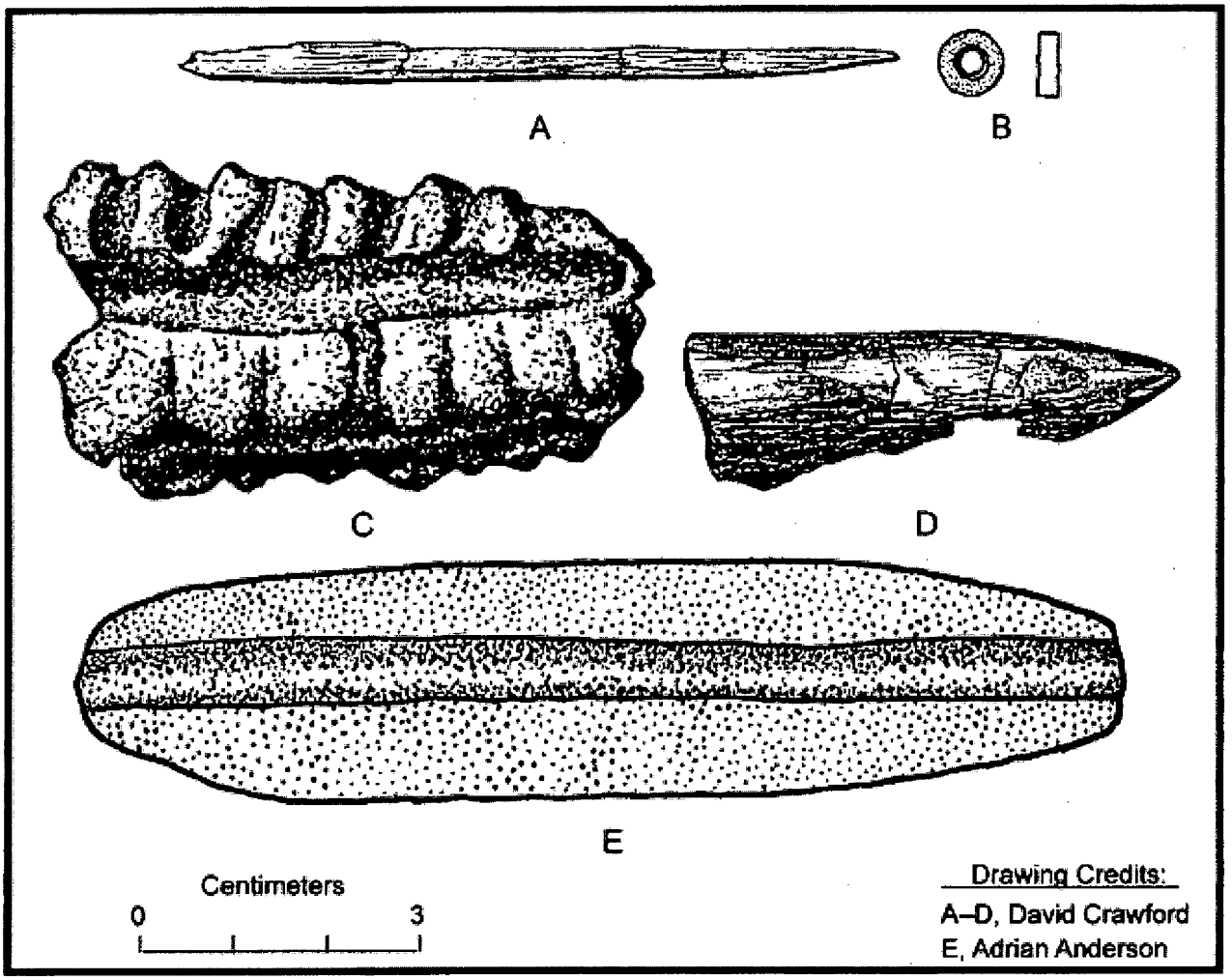

Figure E14. Miscellaneous artifact types from Nebraska phase sites in the Glenwood locality. A: Bone awl, 13ML175; B: marine shell bead, 13ML175; C: sandstone abrader, 13ML155; D: bone digging stick tip fragment, 13ML175; E: one-half of a paired sandstone arrow shaft smoother (adapted from Anderson 1961 and Morrow 1995).

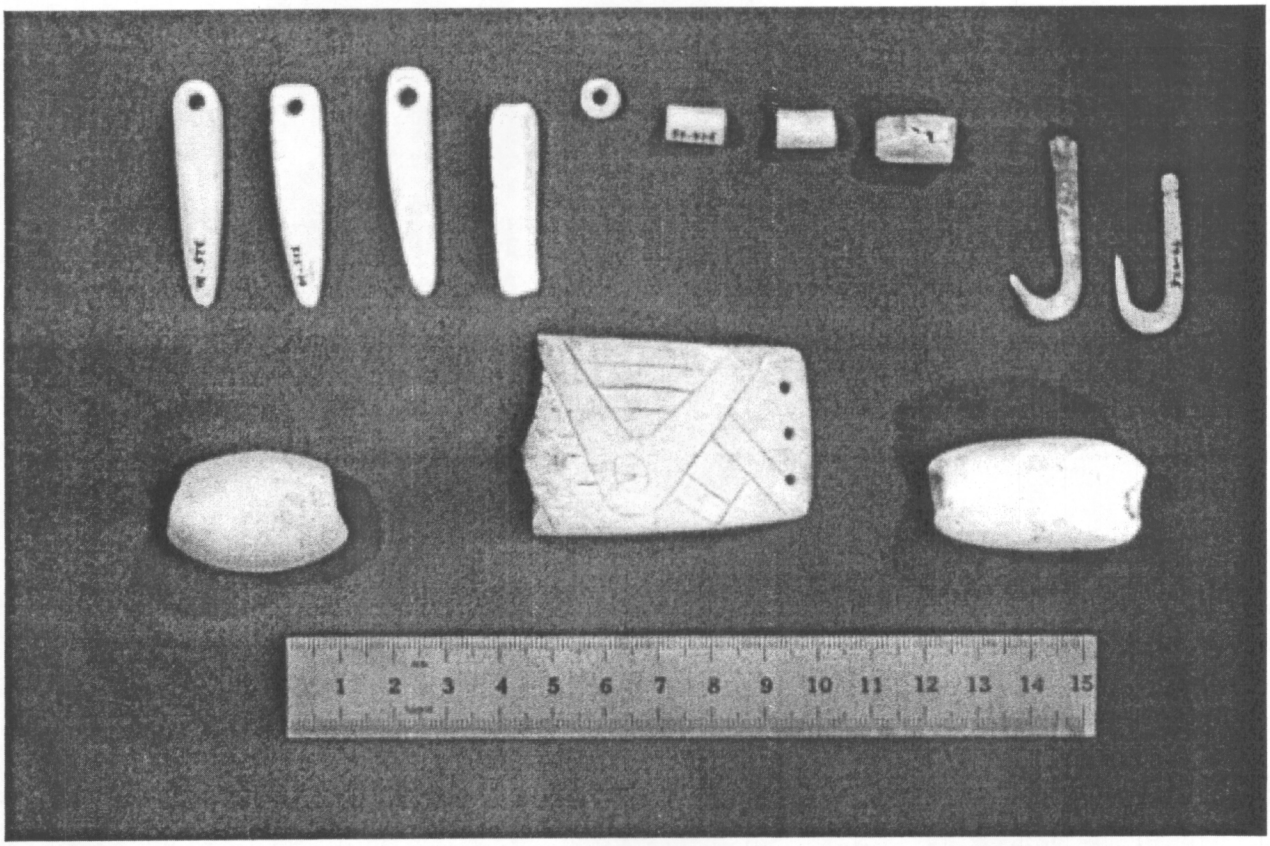

Figure E15. Selected Nebraska phase bone and shell artifacts from unspecified sites in the Glenwood locality (from Office of the State Archaeologist 1978a:G45). Upper: shell pendants, bone beads and fishhooks. Lower: shell beads, carved bone with weeping eye motif.

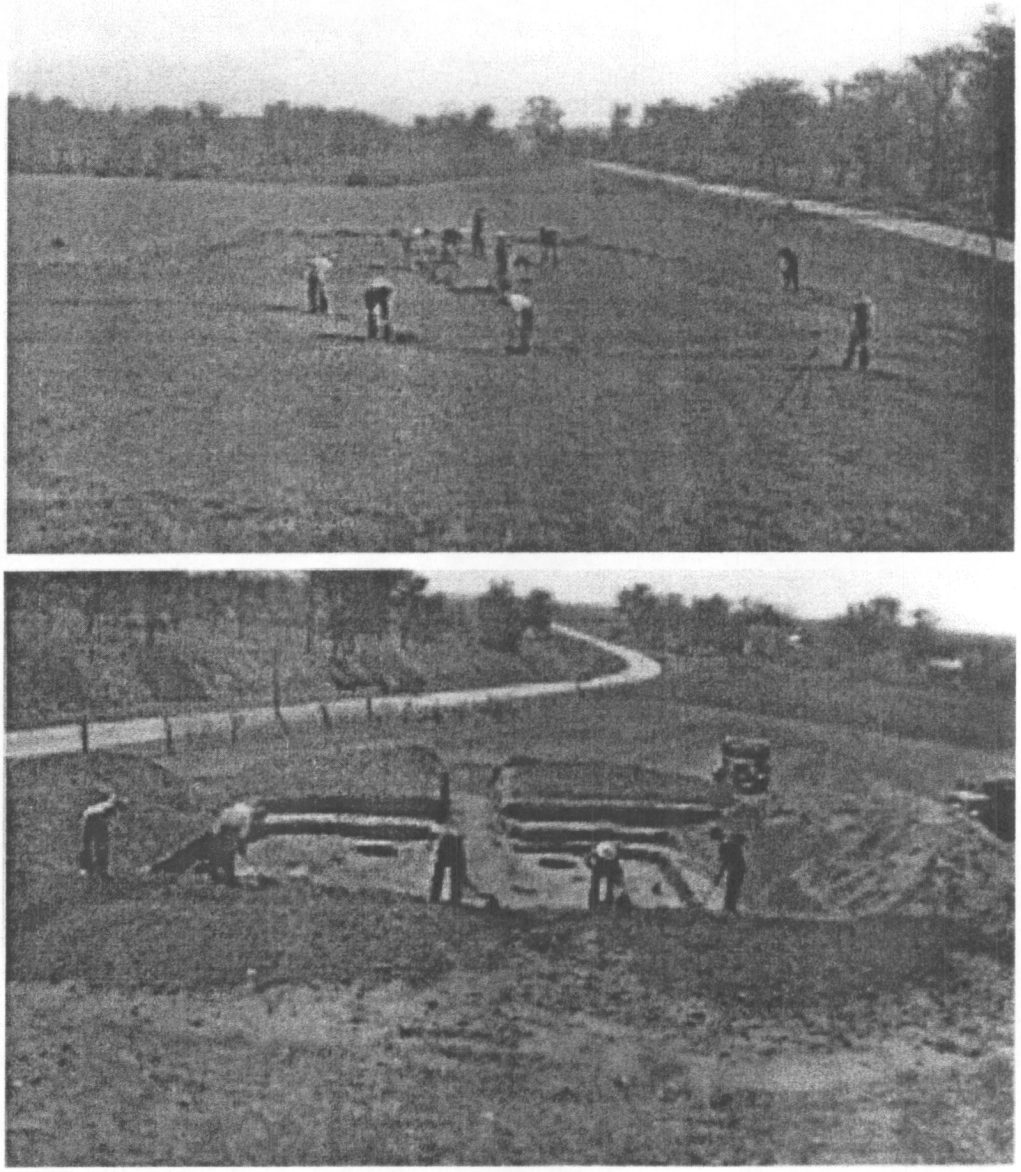

Figure F1. Photograph showing typical method of Orr's 1938 excavations of Glenwood locality earthlodges, where only the interior of the lodge was disturbed (from Orr 1953a:97). Note the presence of a surface depression, even though site is in a cultivated field. This site is almost certainly 13ML235. Original caption reads: Upper: Men cleaning up bowl of Earth Lodge X, the McManigal Site before excavation. Lower: View of house pit, McManigal Site from the North. Men at work sloping north bank in order to be able to get more complete photograph.

Figure F2 . Archaeologists excavating a Nebraska phase earthlodge alongside a belly scraper earthmoving machine during reconstruction of highway U.S. 34 in the late 1970s. Specific site number not known (from Office of the State Archaeologist 1978a:G5).

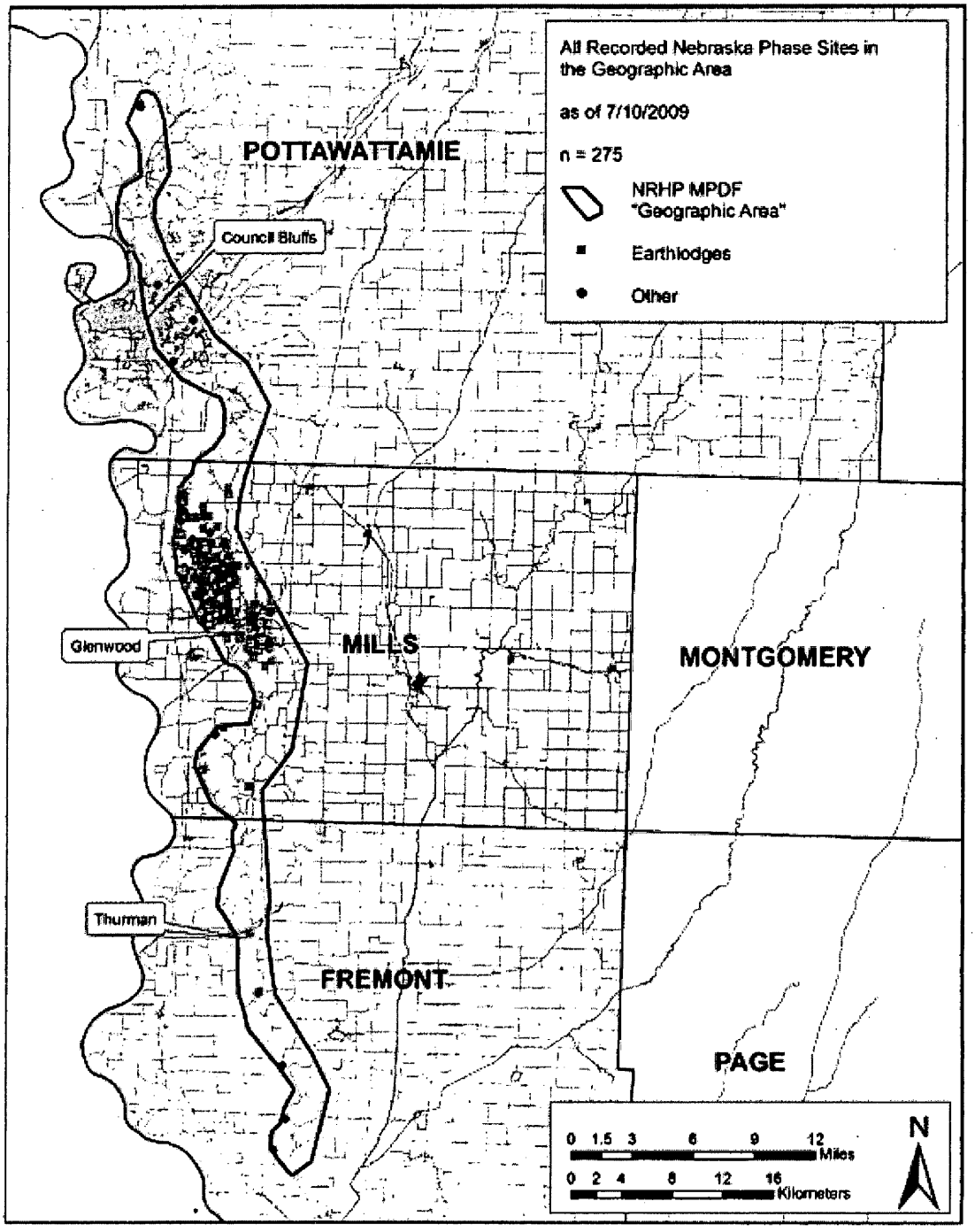

Figure G1. Location of the Geographic Area of the MPDF, Archaeological Resources of the Central Plains Tradition in Iowa *in relation to modern road system and counties (base map from Iowa Geographical Server 2009).*